

**XEROX**

**ANALYST**

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STRUCTURED SYSTEMS GROUP, INC.  
ADDENDUM TO ANALYST DOCUMENTATION  
FOR XEROX 820 WITH 5 1/4" DISK DRIVES

Special Version

This is a special version of SSG'S Analyst for Xerox 820 microcomputers with 5 1/4" floppy disk drives.

Programs Reside on Three Disks

The Analyst programs reside on three diskettes. They are labeled DISK 1, DISK 2, and DISK 3. To set up your Analyst, copy each disk. Put an operating system on each copy. Label them DISK 1, DISK 2, and DISK 3.

To start Analyst place DISK 1 in Drive A, and a blank DATA DISK in Drive B. When the A "prompt" appears, type "AN", then press RETURN:

A>AN                    [RETURN ]

Choosing Programs from the Menu

To run the Analyst programs you choose them from a "menu". When you choose a program from the menu that is not on the disk currently in Drive A, this message appears:

INSERT DISK 2 [or 3, or 1] IN DRIVE A  
AND THEN TYPE RETURN TO CONTINUE

Replace the disk in Drive A with the correct disk, then press RETURN. The program will continue normally.

Important Note

The disk in Drive B is your "DATA DISK". It will hold the "Definition Files" that Analyst creates, and should also hold the data files you create. WHENEVER ANALYST ASKS YOU FOR A DISK DRIVE LOCATION, ANSWER DRIVE B.



## OTHER INFORMATION

1. When you are prompted to change disks, do not give the CONTROL-C command (see Reference Manual, p. 7).
2. The QSORT.COM program, if used, should be placed on DISK 1.
3. The ANPR1.101 file is not used in this version (see Reference Manual, pp. 114-115). Except for the date, the "Startup Requests" explained on page 9 of the Reference Manual are not issued.
4. To sort a full disk of data a "sort work disk" is needed. See Reference Manual, p. 44. To extract a full disk, see p. 92.
5. The Analyst programs for this version have a filetype of INT, not SSG.



**ANALYST**

**DATA ENTRY AND REPORT WRITING SYSTEM**

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Structured Systems Group, Inc.

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INCORPORATED

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# 1. Introduction

The Analyst manual is written for convenient use by the novice and the pro. Each chapter builds on information presented in the previous chapter, so new users are introduced to advanced topics gradually. The manual assumes no previous computer experience. Numerous examples illustrate points made in the body of the text and each chapter covers a separate topic for easy reference.

Start with the Preliminaries and Basics. These chapters teach you enough to do useful work with Analyst. Then move on to Advanced Topics. A number of applications are suggested in the text and examples. Once you understand how Analyst works many more will spring to mind. Analyst is a generalized tool with wide applicability. From simple reports to complex data processing applications, for your personal, professional, and business use, Analyst handles many entry, processing, and print routines that previously required skilled computer programmers.

The best way to learn Analyst is to try it. Nothing you type can hurt the computer, and you can always erase what you've done and start over. A little practice will make many of the concepts covered in this manual clear to you.

If you just received your Analyst package and haven't set it up yet, refer to Chapter 30, Installing Analyst on Your Computer. Be sure to copy the Analyst disk you received from your dealer or SSG, and set up the "run-time" interpreter (your dealer may have already taken these steps). Complete instructions are provided that work for most computers.

Data files created with Analyst version 1.0 are compatible with Analyst version 2.0 after a simple conversion process. Chapter 29 explains the procedure for converting your data files to the new file format.

Because computers differ widely in operation, this manual cannot explain (except generally) the following:

1. How to turn your computer ON and OFF.
2. How to insert disks into your computer.
3. How to prepare blank disks for your computer (i.e., how to FORMAT a disk and how to SYSGEN the operating system).

Find out how to do these things from your dealer or supervisor (or refer to the hardware and operating system manuals). Some keys on your keyboard may have different labels than those assumed in this manual (for example, RETURN vs. ENTER, or BACKSPACE vs. DELETE), check with your dealer if it is not obvious which key is being referred to in the documentation.

Structured Systems Group wants you to get the most out of Analyst. Your comments and suggestions for improving this manual are welcomed. Please direct them to the Structured Systems Group Documentation Department.

## 2. Overview

If you need reports like the one below (Figure 2.1), Analyst can help you prepare them quickly, efficiently, and at low cost.

UNIVERSAL SALES COMPANY				PAGE 1
SIMPLE SALES REPORT				DATE 01/15/81
PRODUCT	SALESPERSON	AMOUNT	% OF PRODUCT	% OF GRAND TOTAL
Product 1				
	Abel, Alan	100.00	16.66%	6%
	Brown, Bob	200.00	33.33%	12%
	Crow, Carrie	300.00	50.00%	20%
	TOTAL PROD 1:	600.00	100.00%	40%
Product 2				
	Abel, Alan	200.00	22.00%	12%
	Brown, Bob	300.00	33.33%	20%
	Crow, Carrie	400.00	44.67%	28%
	TOTAL PROD 2:	900.00	100.00%	60%
	TOTAL SALES:	1500.00		100%

Figure 2.1: Sample Report

### HOW DOES ANALYST WORK?

Analyst is a general purpose information storage and retrieval tool. It keeps customer and employee records, sales statistics, inventory lists, stock portfolios, schedules, name and address lists, student grades, class enrollment records, book and record collections, plus many more.

To create a new application for Analyst, you simply tell it what "data items" you want to store and report on. Four types are possible: numeric, integer, alpha, and date. You define the length (in characters), and type in a description for each. The description later appears as a "prompt" in the data entry program that asks for the information.

Once you've defined the items that make up a "data record", you can begin adding records to your "data file". A "data file" is simply a collection of identical "data records". A "data record" is a collection of "data items". The number of records you can store on a single data file is limited only by the disk storage capacity of your computer. The number of data files you can create is unlimited. You can add records, change them, delete them from the file, and examine them on the video screen.

To add new information to a data file you select the Create or Modify a Data File program from the Analyst "menu", tell it which data file you want to work on, then answer the requests presented on the screen by typing

in your response:

```
ENTER SALESPERSON'S NAME
CURRENT VALUE:
NEW VALUE:   Abel, Alan
```

Press the RETURN key after each response. Typo's can be erased with the BACKSPACE key. If you're modifying data on a record entered previously, Analyst displays the current value. After you press RETURN the new value becomes the current value. You can't make a mistake Analyst won't recognize. If it is not obvious what to do, the numbered error messages are fully explained in the manual.

Next you'll want to print out the data you've entered. Before you can do so, however, you must define the desired report format. Which data items do you want to print? Do you want headings or titles? How about totals and subtotals? Do you want to do math across the columns? Print only selected records? Although a wide range of report formatting options are available, you need only learn a few to begin producing useful reports. You can define an unlimited number of reports on a single data file.

To print a report select Print a Report from the menu. Turn on your printer and adjust the paper, then tell Analyst which report to print. To halt the printout at any point, press any key on the console keyboard. Analyst will ask if you want to stop or continue. Aborting a printout does not harm the data file in any way. Another option lets you print the report on the video screen instead of the printer.

An Enquiry program lets you view information on screen for immediate analysis. You can select data file records for display if a given data item (or items) falls within a range of values, or if it matches some pattern you specify. Multiple "record selection conditions" can be linked by AND or OR conjunctions. For example, "find all doctors who live in zipcode areas 60000 to 69999, and who own Cadillacs more than two years old".

An Extract program is provided in case you want to change the number or length of items on a data file. Analyst can read data files created by computer programs written in the CBASIC (tm) programming language too.

### 3. Getting Started

To work with Analyst you need a disk that contains the Analyst programs. Don't use the disk you originally received from your dealer or SSG for actual work (see Chapter 30). Unless you plan to create your data files on the same disk as the programs, you'll need some blank disks too.

Some computers require new disks to be "formatted" before use (see Chapter 31). Any disk that you want to put in drive A must have an "operating system" on it. To put an operating system on a formatted disk you use the SYSGEN program that comes with the CP/M Operating System (see Chapter 31). If you're running Analyst on a "hard disk" system you don't need to worry about formatting or the SYSGEN program.

Some kinds of disks must be "write-enabled" before use. In some cases this means placing an adhesive foil tab over a small notch on the edge of the disk. Or it may mean taking the foil tab off the disk. A disk that has not been write-enabled is called "write-protected". The computer cannot add to or modify information on a write-protected disk. Ask your dealer or supervisor whether the foil tab "write-enables" or "write-protects" your disks.

#### RECOMMENDED PROCEDURES

If the data stored on disk is valuable be sure to make "back-up" copies of the disk frequently. Although Analyst can protect against many errors, it cannot stop you from dropping your disk in a mud puddle or stepping on it. Nor, unfortunately, can it prevent catastrophic "hardware errors" that "crash" a disk (that is, make its contents unreadable). Typically, back-up copies should be made after any major change to the data file (addition of new records, changes to old records, etc.). When the data file is updated frequently, once a day backup is usually sufficient. You may want to keep several generations of back-ups.

Handle the disks carefully. Avoid touching the magnetic material exposed through the protective cover. The dirt and grease on your fingers can make the disk unreadable. When not in use diskettes should remain in the protective "sleeve". Keep them away from excessive heat or magnetic forces.

Label your disks. Most people have their own system. You'll want to indicate the contents of the disk and perhaps include the date it was last updated. Be sure to distinguish BACK-UP disks from WORK disks to avoid processing the back-up version. Don't write on the label with a ball-point pen; felt-tip is preferable, or write on the label before you apply it to the disk.

Design the data file record structure and report formats on graph paper. This takes the guesswork out of report preparation. You know at a glance the position and length of any data item, or the column where a data item or title should be printed on your report. "Spacing charts" are available especially for the purpose; ask your dealer about them.

If you encounter a serious error write down in detail the processing steps you took prior to the error. Include error messages or message numbers. Before attempting corrective action make a back-up copy of the

disk. If your recovery attempt fails you can at least get back to where you were.

#### THE FIRST TIME YOU USE YOUR ANALYST PACKAGE

Go through the checklist below. Check off the steps as you complete them. Chapter 30 explains how to install Analyst on your computer.

1. Have you made a back-up copy of the "distribution" disk you received from your dealer or SSG? (Chapter 30.)
2. Did you rename the "run-time" interpreter program for your version of the CP/M Operating System? (Chapter 30.)
3. Check the directory of your WORK disk that holds the Analyst programs by typing DIR at the A> prompt character. Are all of these programs on the disk?

AN.SSG  
ANBLDFIL.SSG  
ANCONVRT.SSG  
ANDATENT.SSG  
ANDEFALT.SSG  
ANEXENT3.SSG  
ANEXENT4.SSG  
ANEXENT5.SSG  
ANEXENT6.SSG  
ANEXENT7.SSG  
ANEXTENT.SSG  
ANEXTRAK.SSG  
ANQUERY.SSG  
ANRPENT2.SSG  
ANRPENT3.SSG  
ANRPENT4.SSG  
ANRPENT5.SSG  
ANRPENT6.SSG  
ANRPENT7.SSG  
ANRPTENT.SSG  
ANRPTPRN.SSG  
ANSQUASH.SSG  
ANSRTPRM.SSG  
AN.COM

4. Is there a file named AN.COM? If not, look for AN1.COM or AN2.COM and refer to the section on "run-time" interpreter setup, Chapter 30.
5. If you plan to sort your data files make sure the program named QSORT.COM is also on your disk. QSORT is a Structured Systems Group product that must be purchased separately.

## 4. Inserting Your Disks

Before you start, find out how to turn on the computer and insert the disks. Where is the ON/OFF switch? Should the label face up or down? left or right? Does the disk need a "write-enable" tab, or does the tab "write-protect" the disk? (Write-enable and write-protect are explained in Chapter 3.) How do you close the disk drive door? How do you open the door and remove the disk? Where is the "reset" (or "start") button on the computer? These questions should be answered before you begin. You might want to jot the answers in the margin of this manual.

### HOW MANY DISKS DO YOU NEED?

The simplest way to run Analyst is with a single disk in drive A. It must contain the Analyst programs, and will eventually hold your data files once they have been created. This scheme is best for practicing with Analyst when you have at least 300K of storage per disk.

When you do serious work you'll probably want to put the Analyst "program disk" on drive A, and a blank disk (your "data disk") on drive B. When ever asked, respond that you want to create your files on drive B. This scheme gives you more room for data and simplifies the back-up, sorting, and extract procedures.

Actually, you can put your program or data disks on any disk drive. Most "floppy disk" computers have from one to four disk drives, named A, B, C, and D. (or 1, 2, 3, 4). However, you must have a disk in drive A at all times. "Hard disk" users can specify any valid drive name from A to Z.

### HOW TO START UP THE COMPUTER

1. Make sure the cables are connected and the computer is plugged in.
2. Turn on the computer and "peripheral" devices, if any.
3. Insert a disk into drive A, seat it properly, then gently but firmly close the door.
4. If you are running Analyst with disks in other drives, insert them too.
5. Press the RESET or START button. The CP/M "prompt" character A> should appear. If it does not, make sure an operating system has been SYSGEN'ed onto the disk (Chapter 31) and that the disk is inserted correctly. You are now ready to call up the Analyst menu.

BASIC RULES FOR OPERATING ANALYST

1. In general you must press RETURN after typing a command or responding to a request. When you are asked to press the ESCAPE key, you must follow with RETURN also.
2. Most computers use the BACKSPACE key to erase miskeys. Some use the DELETE key. CONTROL-H is the same as BACKSPACE.
3. In general, pressing ESCAPE (followed by RETURN) ends the current function or program.
4. To issue a CONTROL (or CTRL) command, such as CTRL-H or CTRL-P, hold down the CONTROL key and press the required letter key. The CONTROL key works like the SHIFT key on a typewriter.
5. Whenever you change disks (except when prompted to do so by a program you are operating) you must tell the computer immediately after the new disk has been inserted. You do this by pressing the RESET or START button on your computer, or by giving the command CTRL-C.
6. Avoid exposing your diskettes to excessive heat or magnetic forces. Handle them with care, and store them safely away after use. Avoid touching the magnetic material exposed through the protective cover since dirt or grease can make the disk unreadable.
7. In general, double quotes (") are not acceptable input to any request.
8. When asked for a date, you must type the slash marks (/), but need not include leading zeros for single digit days or months (e.g., 1/5/81).
9. Most requests display a CURRENT VALUE and allow you to enter a NEW VALUE if you desire. Even if you only want to change part of the CURRENT VALUE (say, a misspelling), you must type the NEW VALUE completely. To set the CURRENT VALUE to all blanks, you need only type a single blank as the NEW VALUE. To leave the current value the same press RETURN.

## 5. The Analyst Menu

Programs in the Analyst system are run by choosing them from the "system menu", sometimes called the "main menu" (to distinguish it from "sub" menus in the system).

### HOW TO CALL UP THE MENU

To call up the Analyst system menu, type AN at the CP/M prompt character (see Chapter 4), then press RETURN. For example,

```
A>AN          [follow with RETURN]
```

You may also call up the menu by typing AN MM/DD/YY (leading zeros not required, but the "slash marks" are). For example,

```
A>AN 6/25/81  [follow with RETURN]
```

If Analyst does not recognize the command (AN?), review the checklist in Chapter 3, Getting Started.

### "LOG ON" MESSAGES

Analyst next displays the "run-time" interpreter version number:

```
itworks ver 1.00 29/SEP/80 for cpm ver 2.2 [or cpm ver 1.4]
```

If Analyst tells you that you have the wrong run-time interpreter program for your version of CP/M, see Chapter 30.

Next the SSG copyright notice appears:

```
COPYRIGHT (C) 1981, STRUCTURED SYSTEMS GROUP, INCORPORATED
```

It is against the law to remove this message by any means.

After the copyright notice, the Analyst version number and the serial number of your Analyst package should appear. Your version number may differ from the one in this example:

```
ANALYST VER:2.0      SERIAL NUMBER: 650
```

### START-UP REQUESTS

Before Analyst presents the menu it issues several "start-up requests". The first two requests are not asked if the file named ANPR1.101 exists on the disk with the programs. If ANPR1.101 is not on your disk and if you have less than 45K of random access memory, Analyst asks additional questions, which are explained in Chapter 30.

ENTER DEFINITION FILE DRIVE: Where should Analyst create the files that define the data file record structure, report formats, sort parameters, and extraction criteria (FIL, RPT, SRT and EXT files)? The drive location of the data file itself is requested later, and may be different. Respond with a valid disk drive name from A to Z. If you have only one disk and it is in drive A, type A or simply press RETURN. RETURN by itself means you want to create the definition files on the "currently logged" drive.

If you request a definition file that is not on the disk in the Definition File Drive, Analyst will tell you it is NOT FOUND. The name of the Definition File Drive (A-Z) is stored on the file named ANPR1.101, which Analyst creates on the program disk if it does not exist. ANPR1.101 is a "parameter file" that stores information you can change to customize Analyst to your computer. Unless the ANPR1.101 file has been customized, the easiest way to change the Definition File Drive is to erase the ANPR1.101 parameter file (ERA ANPR1.101). The next time you call up Analyst, it will ask for the Definition File Drive location.

ENTER SCREEN SIZE (1=24x80, 2=16x64): Enter the size of your screen in rows and columns by typing 1 or 2. RETURN is the same as typing 1.

ENTER SYSTEM DATE (MM/DD/YY): If you did not enter the date when you called up the menu, enter it now. This date is used as the "default value" for date requests issued by the Create Or Modify a Data File program. If you modify the ANPR1.101 file (see Chapter 30), you can enter dates in the international date format (DD/MM/YY).

### SELECTING PROGRAMS FROM THE MENU

The Analyst system menu appears next (Figure 5.1). To select a program, type the number and press RETURN. To end Analyst, press the ESCAPE key, followed by RETURN. Each menu function is explained briefly below.

## Chapter 5: The Analyst Menu

```
*****      A N A L Y S T      *****
              A N A L Y S T      S Y S T E M      M E N U

1  DEFINE A DATA FILE           2  CREATE OR MODIFY DATA FILE
3  DEFINE A REPORT               4  PRINT A REPORT
5  DEFINE AN EXTRACTION         6  EXTRACT
7  DEFINE SORT PARAMETERS       8  SORT DATA FILE
9  ENQUIRY                     10  CONVERT DATA FILE FORMAT
11 NEW DEFINITION FILES         12  CHANGE SYSTEM DATE
CR REFRESH MENU                ESC  STOP PROGRAM

              ENTER NUMBER OF FUNCTION DESIRED:
```

Figure 5.1: The Analyst System Menu

- (1) DEFINE A DATA FILE: Start here to develop a new application for Analyst. Once you've created the data file do not change the data file specifications (the data item descriptions may be changed, however).
- (2) CREATE OR MODIFY DATA FILE: After defining a data file, you add records to it. Use this program to add, change, examine, or delete records on a data file.
- (3) DEFINE A REPORT: Use this program to define any number of report formats for a given data file. You must run Define a Data File first. You are not required to run Create or Modify Data File before you define a report.
- (4) PRINT A REPORT: Print a report defined previously.
- (5) DEFINE AN EXTRACTION: Run this program if your report format calls for mathematical functions involving grand totals, if you want to change the length, type, or number of data items on a data file, or to create a new data file that is a selected subset of records from the old data file.
- (6) EXTRACT: Perform an extraction defined previously.
- (7) DEFINE SORT PARAMETERS: If you want to sort a data file (required for report subtotals, "lookahead" titles, and keyed access to data records), you must tell the sorting program what file to sort, the order to sort it into, and where to put the sorted version of the file that is created.
- (8) SORT DATA FILE: Perform a sort defined previously.
- (9) ENQUIRY: May be run at any time to examine records on a data file. Records are selected for review based on record selection criteria

you define.

- (10) CONVERT DATA FILE FORMAT: Converts data files from CBASIC file format to Analyst format, and vice versa. Converts data files built under Analyst version 1.0 to the Analyst version 2.0 format.
- (11) NEW DEFINITION FILES: Analyst makes assumptions about which definition files to use to print reports, extract, sort, etc. For example, if you choose Create or Modify a Data File after running Define A Data File, Analyst assumes you want to create or edit the data file you just defined. If the assumption is incorrect, select this menu function before you select the program you want to run. Analyst will then ask for the name of the file to use.
- (12) CHANGE SYSTEM DATE: Select to change the system date, which prints on reports, and is used as the "default" value for date data items.
- (CR) REFRESH MENU: CR stands for "carriage return" which is the same as the RETURN key. If the menu becomes garbled for any reason, press RETURN to refresh it.
- (ESC) STOP PROGRAM: Press the ESCAPE key followed by RETURN to end Analyst.

#### HOW TO END THE ANALYST SYSTEM

To end Analyst, press the ESCAPE key at the main menu "Enter Function" request. Follow with RETURN. When the CP/M prompt appears, and (on most computers) when the "access light" on the disk drive goes out, you may open the door to remove your disk. For safety, never remove a disk when the menu is showing or when one of the programs is in operation.

## 6. Define a Data File

Purpose: Before you can print a report, you must have a data file to report on. And before you can create a data file, you need to define what information the "records" on the data file should hold (the "data file record structure"). The Define a Data File program describes the prototype data record.

Define a Data File asks for the length, type, and description of each "data item" on the typical data record. Your answers are stored on a "FILE DEFINITION FILE", which is referred to by other programs. This file is also called a "FIL" file. The FIL file contains the name of the data file it defines. Remember its name, since other programs will ask you for it.

Background: A "data file" is a collection of "data records" that are identical in structure, but not content. When you define a data file you are actually defining the number, length, and type of "data items" stored on each data record. Later you will create the data file and add records to it. It's like building "boxes" to hold the data you enter later.

### HOW TO DEFINE A DATA FILE

1. Select #1, Define a Data File, from the Analyst menu. If a FIL file created previously has been used during the current session, Analyst assumes you want to change it. If you do not, select #11, New Definition Files, before choosing Define a Data File. Doing so cancels any assumptions about which file, report, or extraction definition files to use (no requests are issued).
2. Answer the request for the name of the File Definition File by typing an (up to) eight character "filename" (e.g. CLIENTS, VOUCHERS, etc.). See the ENTER NAME OF FILE DEFINITION FILE request below for rules on acceptable filenames.
3. Answer the requests described in the next section of this chapter. Use BACKSPACE to erase typos, an up-arrow (^) to go back to the previous request, and RETURN to accept the CURRENT VALUE.
4. After answering all the requests, press ESCAPE followed by RETURN to end, or RETURN to review or correct your responses.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: Type the (up to) eight character filename of a File Definition File you want to edit or create. It may not contain the following symbols:

. , : = ; \* ? [ ] < >

Nor may it include "imbedded blanks" ("EMP NAME" contains an imbedded blank, but "EMPNAME " does not). This request is not for the name of the data file defined by your "file definition file". Once the data file is created, the "file definition file" should not be changed (except for the data item descriptions). The Extract program may be used to change the data file record structure after it has been

created (see Chapter 27).

FILE DEFINITION FILE NOT FOUND. CREATE ONE? (Y OR N): Issued when the file named in the previous request has not yet been created, or cannot be found on the drive named as the DEFINITION FILE DRIVE (see Chapter 5). Answer Y (for Yes) to create it. If you created it before, but receive this request, you may have misspelled the name or inserted the wrong disk. If so, type N (for No) and the program will reask the previous request.

NAME OF DATA FILE DEFINED (nnnnnnnn.ttt): Name the data file whose record structure you are about to describe. Give it an (up to) eight character filename (nnnnnnnn) and three character filetype (ttt), separated by a period. The following filetypes are reserved and should not be used: FIL, RPT, EXT, SRT, \$\$\$, BAK, ASC, OLD, and FLO. It is often a good idea to give the data file the same name as the File Definition File. We suggest the filetype of DAT for data files, but any can be used.

It is possible, but not common, to create more than one FIL file for a data file. If, for example, you do not want the data entry clerk to view or change certain data items, create a different FIL file that defines the same data file, but set the description to all blanks for the data items you want to suppress (entering one or more blanks for the description suppresses the request). When you run Create or Modify a Data File, give the name of the new FIL file instead.

DATA FILE DRIVE: Name the disk drive you want to hold the data file. A through Z are valid drive names. RETURN means the "currently logged" disk drive (Chapter 31). There must be a disk in the drive you name. If your Analyst programs are on A, it is common to assign data files to B, which is usually the DEFINITION FILE DRIVE (see Chapter 5). If you're practicing, drive A is acceptable if it has a capacity of over 300K.

DESCRIPTION OF DATA FILE: A 30 character description may be entered to help identify the file (e.g., "Daily Sales Statistics")

NUMBER OF DEFINED ITEMS PER DATA RECORD: Enter the number of data items you want to store on the file, up to a maximum of 50. Analyst asks the questions below for each data item. Although 50 data items are allowed, the total record length may not exceed 255 bytes (characters).

ITEM NUMBER: n  
THIS ITEM DEFINES DATA ON THE FILE THAT BEGINS WITH POSITION nn (INCLUSIVE): The program displays the starting position of the item on the data record, beginning with the first data item defined. It adds the length of the data item to its starting position to arrive at the starting position for the next data item on the record. The total record length is the sum of the lengths of the individual data items, plus three.

DESCRIPTIVE NAME OF ITEM: Up to 30 characters may be entered. Your response becomes the data entry "prompt" issued by the Create or Modify a Data File program, so you may want to give the description in question form ("Name of Salesperson?" as opposed to "Salesperson's Name"). The

## Chapter 6: Define a Data File

description may be entered whenever Analyst asks for the name or number of a data item (it may be typed in upper or lower case, but the spelling must be correct). Each data item should have a different description.

ITEM TYPE (1=NUMERIC; 2=INTEGER; 3=ALPHA; 4=DATE): Each data item is assigned a type. Enter 1, 2, 3, or 4, or a unique portion of the type description (for example, "NUM" for "NUMERIC"), in upper or lower case. The first letter is sufficient at this request.

NUMERIC: NUMERIC data items may contain up to 14 digits, with a maximum of 12 to the right of the decimal. The maximum length you assign to the item may be more or less, to allow for the decimal, minus sign, or smaller numbers. Commas are not stored on the data file ("1,250.35" takes 8 columns to print, but 7 to store on the data file); Analyst inserts them when needed. Dollar amounts are numeric with two digits to the right of the decimal. Numeric data may be added, subtracted, multiplied, and divided. They are "right justified" when printed on reports.

INTEGER: INTEGER data items may hold an up to 14 digit whole number (no decimals). The maximum length may be more or less, to allow for a minus sign or smaller numbers. You may add, subtract, multiply, and divide integers. They print right justified on reports.

ALPHA: ALPHA items store alphanumeric data such as names, descriptions, identification numbers, status indicators, etc. They treat numbers as text, which means they are left justified when printed on reports, and may not be added, subtracted, etc. All printable symbols are accepted, except double quotes ("). If you enter data that is longer than the maximum for the data item, you will receive a TRUNCATION OCCURED message.

DATE: DATE items accept only valid dates (March 32 is invalid), entered in MM/DD/YY or DD/MM/YY form (the latter only if the ANPR1.101 file has been modified; see Chapter 30). Slash marks (/) must be typed, but not leading zeros for single digit months or days. Date items may be printed in the American or international date format (DD/MM/YY), but are stored in YYMMDD form on the data file (occupying 6 characters per record).

MAXIMUM LENGTH OF DATA ITEM: Enter the largest number of characters you'll want to store for the item (for example, 5 for zipcode, 25 or 30 for name, etc.), which may differ from the number of positions required to print the item on a report. The largest maximum allowed for an ALPHA item is 132. NUMERIC and INTEGER items have a maximum of 15 and 14, respectively. Dates always have a maximum length of 6.

THE TOTAL COMBINED LENGTH OF ALL THE DATA FIELDS ON THE FILE IS nnn  
THREE BYTES ARE ADDED TO THE RECORD LENGTH  
TO ACCOUNT FOR THE LEAD IN CHARACTER AND FOR  
THE RETURN/LINE FEED AT THE END OF THE RECORD.  
THE ACTUAL RECORD LENGTH IS NOW nnn+3: Analyst adds up the maximum lengths of the individual data items to get the total combined length. Then it adds three more bytes (characters) to arrive at the actual length of the data record.

DO YOU WISH A HARDCOPY OF THE FILE SPECIFICATIONS? (Y OR N): Analyst prints your responses in report form on 132 column paper. This printout is handy to have, especially when defining "sort parameters". If you answer No, the menu returns. If Yes, Analyst asks you to ENSURE THAT THE PRINTER IS ON, AND HIT RETURN. You can abort the printout for any reason without harm by pressing any key on the console keyboard. When the report is printed the system menu returns.

## 7. Create the Data File You Defined

Purpose: After you define the data file record structure (Chapter 6), the data file itself can be created. Once created it remains on disk, but is empty until you add records to it. This chapter tells you how to create a data file you have defined.

Background: A data file must be created before you can add records to it. Once the data file exists you don't need to create it again. You can add records to it, change records, delete records, and examine records (see Chapter 8).

### HOW TO CREATE THE DATA FILE YOU DEFINED

1. Select #2, Create or Modify a Data File, from the Analyst menu. Answer the requests described below, pressing RETURN after each response. Pressing ESCAPE ends the program at any request.
2. Name the File Definition File (FIL file) that defines the data file you are about to create. If you just ran Define a Data File, Analyst does not ask for the name. If this assumption is wrong, select #11, New Definition Files first. Analyst will then ask for the name of the FIL file to use. If the file you named is not found, it could be misspelled, on a different disk, or not on the disk in the DEFINITION FILE DRIVE (Chapter 5).
3. Analyst next displays the name and description of the data file the FIL File defines.
4. If the data file does not exist on the drive specified when it was defined, Analyst tells you it is NOT FOUND and asks if you want to create it. Answer Y, for Yes, to create the file. Answer N, for No, if the file was created previously and should already exist (make sure the correct disk is inserted in the proper drive).
5. If the data file exists, Analyst tells you the number of records already on it.
6. The program next asks for the "ACCESS KEY FIELD". This request is explained in Chapter 9. If you're just practicing, press RETURN.
7. Analyst then presents the ENTER FUNCTION request, to which you respond by telling the program that you want to add, change, examine, or delete records. This request is explained in the next chapter.

## Chapter 7: Create the Data File You Defined

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: Type the name of the File Definition File that defines the data file you want to create or modify (see Chapter 6). Enter the up to 8 character filename. Refer to a printout of the file specifications, enter it from memory, or exit the program and check the disk directory for the exact filename (it will have a three character filetype, or "last name", of FIL). Do not enter the filetype. Pressing ESCAPE ends the program.

FILE DEFINITION FILE NOT FOUND. CONTINUE? (Y OR N): Issued if Analyst could not find the File Definition File on the DEFINITION FILE DRIVE (Chapter 5). If you type Y, the program reissues the previous request; if N, Analyst returns to the system menu. Make sure the correct disk is inserted and the name is spelled correctly. Remember, this request is for the name of the file that describes your data file, not for the name of the data file itself, which may be different. The data file was named when it was defined (Chapter 6).

DATA FILE NOT FOUND. CREATE ONE? (Y OR N): Issued when the data file cannot be found or has not been created. If you know the file has been created, make sure the data file is on your disk (it might have been erased or renamed). Type Y, to create a new data file, or N, if there has been a mistake. ESCAPE also ends the program.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): See Chapter 9. RETURN is always a valid response.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): See Chapter 8.

## 8. Add Records to Your Data File

Purpose: After you've defined and created your data file, the next step is to add records to it. You may add records to the file at any time. To add a data record to the file you simply answer the requests issued by the Create or Modify a Data File program. Analyst prompts you to enter information for each data item defined.

Background: A "data file" is a collection of "data records". Each record on a data file holds the same data items (Salesperson's Name, Number Sold, etc.). Records on a data file are like index cards in a card file. Each record has a "record number" that is its relative position on the file (e.g., the third record on the file is record number 3). The record number is not actually stored on the data record. New records are always added to the end of the file.

### HOW TO ADD ONE OR MORE RECORDS TO A DATA FILE

1. Select #2, Create or Modify a Data File, from the Analyst menu. Answer the requests described below, pressing RETURN after each response. At most requests pressing ESCAPE (followed by RETURN) ends the current function. Typing an up-arrow (^) takes you back to the previous request.
2. Name the File Definition File (FIL file) that defines the data file to which you want to add records. Check the printout of the file specifications, or enter the name from memory. If you just ran Define a Data File, Analyst assumes you want to use that definition file and does not ask for the name. If the assumption is wrong, select #11, New Definition Files first. Analyst will then ask for the name of the FIL file to use. If the file is not found, make sure you spelled it correctly, and that the correct disk is inserted in the DEFINITION FILE drive (See Chapter 5).
3. If the data file exists, Analyst displays its name, description, and the number of records currently on the file. If the data file has not been created yet, see Chapter 7.
4. Analyst next issues a request for the ACCESS KEY FIELD, which is explained in Chapter 9. When adding records the usual response to this option is to press RETURN; RETURN is always a valid response.
5. The ENTER A FUNCTION request is next. To add a single record type the letter "A" and press RETURN. Answer the requests for data. Use BACKSPACE to erase miskeys, the up-arrow key (^) to go back a request, and ESCAPE to quit. When all the requests have been answered for that record you may press ESCAPE to end, or RETURN to review your answers. Pressing ESCAPE at any point returns you to the ENTER A FUNCTION request. You may add another record in the same way, or enter ESCAPE to return to the Analyst menu.
6. When adding more than one record you can avoid having to answer the ENTER A FUNCTION request each time by typing "ADDING" instead of "A". The program then assumes you want to continue adding records and suppresses the ENTER A FUNCTION request. To end the "add-records mode" press ESCAPE instead of answering the first data entry request of the

next record.

7. After you type "A" or "ADDING" the program prompts you to enter a NEW VALUE for each data item. Type your response, then press RETURN. If your response is invalid (too long, not a real date, too many digits to the right of the decimal, alpha characters in a numeric field, etc.) an error message tells you so and the request is reissued. Most errors are the result of inattention and are easily corrected. If it is not obvious what you did wrong, check the numbered error message in the back of this manual.
8. While in "adding mode", you can duplicate data entered at the same request in the previous record by typing an at-sign (@). Thus, you need not type the entire value if it is the same as the previous record.
9. When adding a large number of records (more than you would care to enter again), it is wise to SAVE them to disk periodically. Saving records means the records you've entered or changed during the current session will not be lost if the computer "goes down" (from a pulled plug, disk error, write-protected disk, etc.). To give the SAVE command, type "S" at ENTER A FUNCTION. When you end the program your work is saved to disk automatically. In the event of a computer failure records entered prior to the last SAVE will be safely recorded on disk.

#### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: See Chapter 7.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): This request concerns how data records added previously may be located for modification, deletion, or examination. When adding, RETURN is the normal response. RETURN means records may be accessed by record number only and not by the contents of a data item (e.g., "find record number 35", but not "find the record for Bob Jones"). The latter method requires that the file be in sorted order; adding records to a file usually puts it out of order.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): The following are valid responses to this request (upper or lower case):

Chapter 8: Add Records To Your Data File

ESCAPE	Stop the program, return to the Analyst menu.
A	Add one record.
ADDING	Add more than one record. Suppress the ENTER FUNCTION request until ESCAPE is entered at the first request of the next record.
C	Change one record.
CHANGING	Change more than one record.
D	Delete one record.
DELETING	Delete more than one record.
E	Examine one record.
EXAMINE	Examine more than one record.
S	Save to disk the additions or changes made to the file in the current session.

[USER DEFINED DATA ENTRY PROMPT]

CURRENT VALUE:

NEW VALUE:

The prompts used for the data entry requests are the data item descriptions entered when the data file was defined. Your responses are tested for validity based on the type of data item.

ALPHA: ALPHA items may contain numbers, letters, or symbols, except double quotes ("), up to the maximum length defined for the item (indicated by the "<" character).

NUMERIC: NUMERIC items may contain up to the maximum number of digits defined for the item. Commas, letters, and other symbols are not accepted. A leading minus sign is allowed for negative numbers.

INTEGER: INTEGER items accept up to the maximum number of digits defined for the item. Integers are whole numbers, with no decimal digits.

DATE: DATE items accept only valid dates in MM/DD/YY form, where the letters are replaced by numbers (for example, 12/5/81). The form DD/MM/YY may be used if the ANPR1.101 file has been modified (see Chapter 30).

Pressing ESCAPE (followed by RETURN) at any data entry request begins the next record (when in adding mode), or returns the ENTER FUNCTION request (when adding a single record). Entering an up-arrow (^) takes you back to the previous request.

SUGGESTIONS FOR ADDING RECORDS

1. Enter names and other ALPHA data consistently in terms of spelling, capitalization, and punctuation.
2. SAVE additions to disk after adding more records than you would care to enter again.
3. When entering numbers that are treated as ALPHA data (such as part numbers, employee numbers, etc.), make sure they line up properly. Make sure you enter a leading blank or zero before "455" so it falls into order before a number like "3551".
4. In order to sort a file by last name, enter the last name first, e.g. "Jones, James B."

## 9. Changing Data Records

Purpose: From time to time you will want to change information stored on the data file to correct inaccuracies or to bring it up to date. This is done by changing a data item's CURRENT VALUE. To change a data record you must first locate it on the file. Records can be accessed for modification in two ways: 1) by entering a record number that is the relative position of the record on the file, or 2) by entering a value stored on the file (access by "record key"; e.g., "get the record for Jones, James B.").

Background: Until you sort the file, records remain on it in the order added. Each record has a "record number" that is its relative position on the file (the first record on the file is record #1, the second is record #2, etc). The record number is not actually stored on the file and changes if the position of the record on the file changes (from sorting, extraction, removal of deleted records, etc.).

The ability to locate records on the file by entering a value on the data record is called "keyed access". Keyed access is possible only when the file is in sorted order. Since a data file may be sorted into many different orders (by name, date, ascending amounts, zipcode, etc.), to use keyed access you must know the current sort order of the file. That is, you must know which data item is the "primary sort key", and thus, the "access key field".

Since you may have several sort keys (for sorting by color within product within region, for example) Analyst must know which one is the primary key. When records on the data file are in alphabetical order by Salesperson's Name, you can locate records by typing a name. If more than one record exists for the salesperson, Analyst presents the first one it finds. If the file is sorted the others should be in close proximity.

### HOW TO CHANGE ONE OR MORE RECORDS ON A DATA FILE

1. Select #2, Create or Modify a Data File, from the menu and name the FIL file that defines the data file you want to modify (see Chapter 7).
2. State if you want to locate records by the "keyed access" method (see Background above), as well as by relative record number. If you do, give the name of the "access key field", (the descriptive name of the data item that is the "primary sort key" ). It must be spelled exactly (but can be in upper or lower case), so check your printout of the data file specifications. You may also enter the data item number, preceded by a pound-sign (e.g., #2). Press RETURN at the access key field request if the file is not sorted at all, or not sorted by the desired access key field (data item).
3. If you chose keyed access, Analyst asks you to confirm that it has the correct key field, then asks if the file is in ascending or descending order.
4. The ENTER A FUNCTION request appears next. Type the letter "C" to change one record, or the word "CHANGING" to change more than one. If "C", the ENTER FUNCTION request returns after the record is modified. If "CHANGING", the ENTER FUNCTION request is suppressed until you leave the "changing mode" by pressing ESCAPE at the RECORD KEY (OR #n)

request. ESCAPE at ENTER A FUNCTION ends the program and returns to the Analyst menu.

5. After you request the change function, Analyst asks for the record to change: RECORD KEY (OR #n). To locate a record by record number, type a pound-sign (#) followed by the record number: to change the thirty-fifth record on the file type "#35". To locate a record by keyed access, type the desired key value: if the file is sorted by Salesperson's Name you can type "Jones, James B." (upper and lower case must be exact). If deleted records are on the file, Analyst may not be able to find a record by keyed access, when it is in fact on the file (Chapter 11 explains deleted records).
6. After it locates the record, Analyst displays the CURRENT VALUE of the first data item. To change the CURRENT VALUE, type in a NEW VALUE completely and press RETURN. If the CURRENT VALUE is acceptable, press RETURN to move on to the next data item request. An up-arrow (^) takes you back one request.
7. Continue until all changes have been made to the record. Press ESCAPE (followed by RETURN) to begin the next record (if "changing", otherwise the ENTER FUNCTION request returns). You may enter ESCAPE at any point while changing a record.

#### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: See Chapter 7.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): If you want to locate records by keyed access, state which data item is the key field by typing the item name or number. You need only type as many characters as it takes to uniquely identify the data item ("Salesp" for "Salesperson's Name", but not if "Salesperson's Number" is also a data item). The data file must already be sorted by the data item you enter. Changing a value in the access key field, or adding records to the file may put it out of order. When the file is out of order, records may be located by record number only. RETURN tells Analyst the file is unsorted or that keyed access is not desired. When in doubt, RETURN is always a valid response.

CORRECT KEY? (Y OR N): When you request keyed access at the above request, Analyst asks you to confirm that it has the right key field. This is because data item descriptions may be very similar.

SORT ORDER ASCENDING? (Y OR N): Asked if you requested keyed access. Is the file in ascending or descending order? Type "Y" if it is ascending, "N" if it is not.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): The following are valid responses to this request (upper or lower case):

Chapter 9: Changing Data Records

ESCAPE	Stop the program, return to the Analyst menu.
A	Add one record.
ADDING	Add more than one record.
C	Change one record.
CHANGING	Change more than one record. Suppress the ENTER FUNCTION request until ESCAPE is entered at the RECORD KEY (OR #n) request.
D	Delete one record.
DELETING	Delete more than one record.
E	Examine one record.
EXAMINE	Examine more than one record.
S	Save to disk the additions or changes made to the file in the current session.

RECORD KEY (OR #n): Issued when the function is change, examine, or delete. To locate a record by record number, type a pound-sign followed by the record number: for example, "#35". If keyed access has been requested you may enter a value in the key field: if the file is sorted by PAYMENT DUE DATE you may type "7/25/81" to find records with a due date of 7/25/81. If there is more than one on the file, Analyst displays the first one it finds, which may not be the first one on the file. The rest should be grouped nearby. (The pound-sign tells Analyst you're entering a record number and not a value in the access key field.)

If deleted records exist on the file, Analyst may not be able to find records by the keyed access method that are in fact on the file (if the file has been sorted recently, this problem probably won't arise). When the file is out of order, access is by record number only.

[NAME OF DATA ITEM USED FOR ENTRY PROMPT]

CURRENT VALUE:

NEW VALUE:

Analyst displays each data item's current value. You can type a new value, or press RETURN to accept the current answer. To replace the current value type the new value entirely. Typing one or more blanks sets the current value to blank. Entering an up-arrow (^) goes back to the previous request. Entering ESCAPE (followed by RETURN) returns you to the RECORD KEY (OR #n) request (when "changing") or to the ENTER FUNCTION request (if "c" was entered). The data entry prompt is the descriptive name of the data item, assigned when the data file was defined.

SUGGESTIONS FOR CHANGING RECORDS

1. Since adding records to a file usually puts it out of order, you may want to change first, then add, if keyed access is desired.
2. If you don't know the number of a record you want to change, use the examine facility to find it, then jot down the number. Examine is explained in Chapter 10.

## 10. Examining Data Records

Purpose: Occasionally you will want to examine data records on the video screen instead of printing a report. The "examine" function of Create or Modify a Data File enables you to "thumb" through records on the file, select records for examination by record number, or locate records for review by the "keyed access" method (see the Background section in Chapter 9). Or you can examine records with the Enquiry program, explained in Chapter 18.

Background: Recall that the "record number" is a data record's position relative to the beginning of the file (the third record on the file is record #3, etc.), and that the record number will change if the record is moved to a different position on the file (by sorting, removing deleted records, extracting, etc.). Newly added records are appended to the end of the data file. Examining a data file means reviewing the contents of a data record in a convenient form on the video screen.

### HOW TO EXAMINE RECORDS ON THE DATA FILE

1. Select #2, Create or Modify a Data File, from the menu and name the file that defines the data file you want to examine (see Chapter 7).
2. State if you want to locate records by "keyed access". See the Background section and Steps 2 and 3 under HOW TO CHANGE ONE OR MORE RECORDS ON A DATA FILE (Chapter 9).
3. The ENTER A FUNCTION request should appear next. Type the letter "E" to examine one record, or the word "EXAMINE" to examine more than one. If "E", the ENTER A FUNCTION request returns when you finish examining the record. If "EXAMINE", the ENTER A FUNCTION request is suppressed until you press ESCAPE at the RECORD KEY (OR #n) request. ESCAPE at the ENTER A FUNCTION request ends the program and returns you to the Analyst menu.
4. Analyst asks which record you want to examine: RECORD KEY (OR #n). To locate a record by record number, type a pound-sign (#) followed by the record number: to examine the thirty-fifth record on the file type "#35". To locate a record by keyed access, type the desired key value: if the file is sorted by Salesperson's Name you can type "Jones, John. J". If deleted records exist on the file, Analyst occasionally may not be able to find a record by keyed access that is in fact on the file (see Chapter 11 for how to remove deleted records).
5. After locating the record, Analyst displays its contents. If you entered "EXAMINE", Analyst presents the RECORD KEY (OR #n) request again. RETURN displays the next record on the file. ESCAPE returns the ENTER A FUNCTION request. If you entered "E", Analyst presents the ENTER A FUNCTION request after displaying the record.

## MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: See Chapter 7.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): See Chapter 9.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): The following are valid responses to this request (upper or lower case):

ESCAPE	Stop the program, return to the Analyst menu.
A	Add one record.
ADDING	Add more than one record.
C	Change one record.
CHANGING	Change more than one record.
D	Delete one record.
DELETING	Delete more than one record.
E	Examine one record.
EXAMINE	Examine more than one record. Suppress the ENTER A FUNCTION request until ESCAPE is entered at the RECORD KEY (OR #n) request.
S	Save to disk the additions or changes made to the file in the current session.

RECORD KEY (OR #n): See Chapter 9.

## SUGGESTIONS FOR EXAMINING RECORDS

1. Often an old report that shows record numbers can help you locate records on the file by giving you an idea of the approximate location.
2. You can use CP/M's CONTROL-P facility in combination with the examine function to make a quick hard-copy print of data records. After typing "E" or "EXAMINE", press CTRL-P. Whatever appears on the screen will be sent to the printer, until you give the CTRL-P command again.

## 11. Deleting Records From the Data File

Purpose: From time to time you will want to remove records from the file that are inaccurate, outdated, or otherwise no longer needed. This is called "deleting". Once deleted a record can no longer be accessed for examination or modification, nor will it print on reports. However, deleted records remain physically on the file, occupying (sometimes scarce) disk storage space, until removed by a program named SQUASH. The Extract program also removes deleted records.

Background: Deleting a record does not actually remove it from the file, but marks it as deleted by setting its contents to all blanks. SQUASH compacts a file by removing the deleted records, thus reclaiming disk storage space. Analyst's keyed access facility may not perform at its optimum when deleted records are on the file. SQUASH'ing a file helps Analyst find records requested by keyed access. Deleted records do not effect access by record number.

### HOW TO DELETE RECORDS FROM A DATA FILE

1. Select #2, Create or Modify a Data File, from the menu and name the file that defines the data file from which you want to delete records (see Chapter 7).
2. State if you want to locate records by "keyed access" in addition to access by record number. See the Background section and Steps 2 and 3 under HOW TO CHANGE ONE OR MORE RECORDS ON A DATA FILE (Chapter 9).
3. The ENTER A FUNCTION request should appear next. Type the letter "D" to delete one record, or the word "DELETING" to delete more than one. If "D", the ENTER A FUNCTION request returns after you delete the record. If "DELETING", the ENTER A FUNCTION request is suppressed until you press ESCAPE at the RECORD KEY (OR #n) request. ESCAPE at ENTER A FUNCTION ends the program and returns the Analyst menu.
4. Analyst asks for the record to delete: RECORD KEY (OR #n). To locate a record by record number, type a pound-sign (#) followed by the record number: to delete the thirty-fifth record on the file type "#35". To locate a record by keyed access, type the desired key value: if the file is sorted by Salesperson's Name you can type "Jones, John. J".
5. Analyst displays the record and asks for confirmation to delete it: DELETE THE RECORD? (Y OR N). Type "Y" to delete the record, or "N" if the record displayed is not the one you want to delete. No leaves the record intact.
6. If you entered "DELETING", Analyst issues the RECORD KEY (OR #n) request again. ESCAPE returns the ENTER A FUNCTION request. If you entered "D", Analyst presents the ENTER A FUNCTION request after deleting the record.

## Chapter 11: Deleting Records From the Data File

### HOW TO SQUASH (COMPACT) A DATA FILE

1. If you deleted records during the current run, or if the program encountered deleted records while searching for a record, Analyst asks if you want to SQUASH the file before returning to the menu.
2. Analyst displays the number of known deleted records and asks, SQUASH THE FILE? (Y OR N). If you answer "N" the Analyst menu returns. If you answer "Y" Analyst displays the name of the data file to be compacted, then asks you to ENTER OUTPUT FILE DRIVE.
3. Since squashing a file creates another copy of it (about equal in size to the "un-squashed" version), Analyst must know where to put the "squashed" version, called the "output file". There must be sufficient disk space available for the output file (see Chapter 32, Calculating Disk Storage Space). The "un-squashed" version is called the "input file". The "output file" contains the records that were on the input file, except for the deleted records. Enter the disk drive location where the output file should be created. If the file is small (not over one-half a disk, with no other large files on the disk) it can usually be created on the same disk as the input file.
4. The input file is renamed to a filetype of BAK (to show that it is a backup, or non-current, version), while the output file takes the name of the original input file. You can erase the backup version with the CP/M ERA (erase) command after leaving Analyst. If the DEFINITION FILE DRIVE (Chapter 5) is the same as the data file drive, and you create the output file on a different disk than in input file, you may have to move the output file back to the original disk before you resume processing. This can be done with CP/M's PIP command (Chapter 31). An alternative is to PIP the files you need from the old disk onto the disk that contains the new (now the current) version of the data file.
5. The SQUASH begins after you name the output file. It may take several minutes if the file is large. Do not interrupt the program until the completion message (ANSQUASH COMPLETED) appears.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: See Chapter 7.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): See Chapter 9.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): The following are valid responses to this request (upper or lower case):

ENTER NAME OF FILE DEFINITION FILE: See Chapter 7.

ENTER ACCESS KEY FIELD (RET IF UNSORTED): See Chapter 9.

ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP): The following are valid responses to this request (upper or lower case):

Chapter 11: Deleting Records From the Data File

ESCAPE	Stop the program, return to the Analyst menu.
A	Add one record.
ADDING	Add more than one record.
C	Change one record.
CHANGING	Change more than one record.
D	Delete one record.
DELETING	Delete more than one record. Suppress the ENTER A FUNCTION request until ESCAPE is entered at the RECORD KEY (OR #n) request.
E	Examine one record.
EXAMINE	Examine more than one record.
S	Save to disk the additions or changes made to the file in the current session.

RECORD KEY (OR #n): See Chapter 9.

DELETE THE RECORD? (Y OR N): Answer "Y" to confirm that you want to delete the record displayed. Type "N" if you do not want to delete it.

SQUASH THE FILE? (Y OR N): Issued after you press ESCAPE to leave Create or Modify a Data File (only if Analyst has found deleted records on the file, or if you deleted records during the current run). Answer "Y" or "N". If you're not sure if there is adequate disk space, answer No, then get set up (insert a blank disk in another drive, or remove unneeded programs or data files to make room, etc.) before continuing.

ENTER OUTPUT FILE DRIVE (@-Z, RET=INPUT): Name the drive where the squashed (compacted) version of the file should be created. There must be storage space available on the drive equal to the size of your data file. Typing an at-sign (@) means you want to create it on the "currently logged" disk drive (see Chapter 31 for an explanation of "logging on"). A through Z are valid drive names. There must be a disk currently inserted in the drive you name. Pressing RETURN means you want to create it on the same drive as the input file.

SUGGESTIONS FOR DELETING RECORDS

1. If you know there are deleted records on the file but Analyst did not offer you the opportunity to remove them, you can force a SQUASH by adding a dummy record, then deleting it. When you exit the program Analyst will ask if you want to SQUASH the file.
2. If you have to change, examine, or delete records during the current session, use the delete function last, if you want to be able to use the record access by key value facility.
3. Changing the contents of a record is the same as deleting it and adding another. This is sometimes more convenient than deleting.
4. If you access the same deleted record more than once, the count of deleted records displayed at the end of processing will be higher than the actual number. This is no cause for alarm, however.

## 12. Design a Simple Report

Purpose: A report is a record by record printout of a data file. The appearance of the report (the report "format") is up to you. You decide which data items to include, the order to print them, how much space to leave between columns of data, and the report titles. Advanced report formatting features let you define totals and subtotals, perform math across columns of data, or print only selected records from the file. This chapter explains how to create the simplest kind of report.

You can create an unlimited number of reports on a single data file. Analyst stores the instructions for each report on a "Report Definition File", which has a filetype of RPT (e.g., SALES.RPT). Thus, you need only define a report format once. To print the Daily Sales Report, for example, you only need to know the name of the Report Definition File.

Background: Recall that a data file is a collection of data records, and that a data record is made up of data items. When the data file was defined, each data item was given a descriptive name. Each data item also has an "item number", which indicates its position on the data record, counting from left to right. The example below shows what a typical data file would look like if you typed out its contents with CP/M's TYPE command (Chapter 31):

```
!810625Green, Ralph      doctor      Cadillac   12000.00
!810625Smith, Sally     lawyer     Cadillac   13500.50
!810626Mahan, Marsha   clerk      Ford       6230.75
etc...
```

(Figure 12.1: Contents of a Typical Data File)

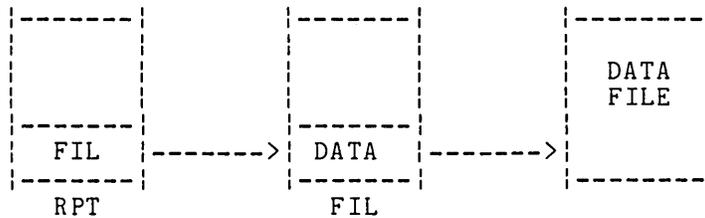
This file has 5 data items per record: one DATE, three ALPHA items, and one NUMERIC data item (ignore the "!" lead-in character). If you want your report to show the name and type of auto, request two "detail line print items", then state which ones (they would be data items #2 and #4). You don't have to TYPE out a data file to learn about its structure. You should already have made a printout of the "File Specifications" (Chapter 6) for reference.

### HOW TO DEFINE A SIMPLE REPORT

To define a report, whether simple or complex, you run Define a Report, which presents a "sub" menu of report definition programs. This chapter explains how to answer the requests issued by two of them: STANDARD PARAMETERS and DETAIL LINE PRINT ITEMS.

We strongly suggest that you lay out the report format on a spacing chart (simple graph paper may work) before running Define a Report. Many requests ask for the column to begin printing a data item, report title, or other report element. If you have to guess to answer these requests, the results may not be what you expected; you'll then have to edit the Report Definition File to correct the erroneous responses. Computer paper 11" x 15" in size divides into 132 columns, or "print positions", when a 10 character per inch printer is used. The 8 1/2" x 11" paper is 85 columns wide.

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When you create a new report you must assign a "first name" (filename) to the file that will hold the report specifications. To change a report defined previously, enter the name of the Report Definition (RPT) File and change the desired responses.
3. When you define a new report, Analyst must know which data file to report on. The program does not ask for the name of the data file, but for the name of the file that defines the data file (the File Definition File, or FIL file), since the FIL file holds the name of the data file it defines. Thus, to print a report you simply enter the name of the Report Definition (RPT) File, which holds the name of the FIL file, which in turn holds the name of the data file. Figure 12.2 shows the relationship between the three files (RPT, FIL, and DATA):



(Figure 12.2: File Pointing in Analyst System)

4. The "Analyst Report Definition Menu" appears next. This chapter explains #1, Standard Parameters, and part of #3, Detail Line Print Items. To return to the main Analyst menu, press ESCAPE at the Report Definition menu. Figure 12.3 shows the Report Definition Menu.

```
*****      A N A L Y S T      *****  
      R E P O R T   D E F I N I T I O N   M E N U  
  
      FILE DEFINITION FILE:   EXAMPLE.FIL  
      REPORT DEFINITION FILE: EXAMPLE1.RPT  
  
      1  STANDARD PARAMETERS           2  REPORT TITLES  
      3  DETAIL LINE PRINT ITEMS,      4  LEVEL BREAKS, CROSS-  
      HORIZ. ACCUMS, AND HEADINGS      FOOTING, AND ACCUMS.  
      5  RECORD SELECTION CRITERIA     6  PRINT REPORT DEFINITIONS  
CR   REFRESH MENU                     ESC  STOP PROGRAM  
  
      ENTER NUMBER OF FUNCTION DESIRED:
```

(Figure 12.3: Analyst Report Definition Menu)

5. Requests issued by Standard Parameters set the page width, lines printed per page, date format (American or international), and whether to send the report to your printer or video screen. Normally you should run this program for every report you define, unless the "default" responses (built in "at the factory", so to speak) are acceptable. Defaults, which are the most common responses, are easily changed by typing a NEW VALUE.
6. To run Standard Parameters, select #1 from the menu. Answer the requests, then press ESCAPE at any point to return to the Report Definition Menu. RETURN leaves the CURRENT VALUE in effect. An up-arrow (^) takes you back to the previous request.
7. Next, select #3, Detail Line Print Items, Etc. to define which data items to print for each record. The "detail line" is the line on which a data record is printed.
8. Press RETURN when asked for the NUMBER OF LOOKAHEAD ITEMS. This is an advanced topic covered in Chapter 21.
9. Press RETURN when asked for the NUMBER OF DETAIL LINES PER DATA RECORD. This is an advanced topic covered in Chapter 22.
10. The next request is for the number of print elements for the first detail line (there can be several detail lines per data record, see Chapter 22). How many print elements do you want on the detail line for each data record? Four kinds of print elements are possible:
  1. Data Items (ALPHA, NUMERIC, INTEGER, DATE).
  2. Literal Values (any combination of letters, numbers, or symbols).
  3. Record Number Counters (relative to the data file, or to the report).

4. Horizontal Accumulators (explained in Chapter 23).

You can print all, or only some, of the data items stored on each data record. If each record holds four data items (Name, Date, Number Sold, Amount Collected), and you want to print all four on the report, the number of "detail line print elements" should be at least 4. Not all of the data items on a record must be printed. In fact, zero (0) is a valid response; requesting zero print elements means only subtotals and totals will print (for a summary report, for example).

You can also print literal values on the detail line. A "literal" print element does not change from record to record. Add the number of literals to the total number of detail line print elements. A literal can be one or more characters, a word, or even an entire phrase. Use literals to print dollar or percent signs next to numeric data, or to print explanatory information with each data record.

Two kinds of "record counters" may be printed on the detail line. ALL RECS prints the record number relative to the data file. SEL RECS prints the record number relative to the report. The former helps you locate records on the data file, while the latter gives you continuous numbering when a report includes only selected records (see Chapter 16).

11. The next request is for the NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS. The Print a Report program prints data records one after the other beginning with the first one on the file. This request lets you print them with double, triple, or even more spacing in between.
12. Press RETURN at the request for the TOTAL NUMBER OF HORIZONTAL ACCUMULATORS. This is an advanced topic covered in Chapter 23.
13. After answering the requests for this section of the program, press ESCAPE to begin the next set of requests, or press RETURN to review or correct your answers.
14. For each detail line print element, Analyst requests the type of item, the column to begin printing it, and (if appropriate) the name or number of the data item. Start with the leftmost print element.

ELEMENT TYPE: What kind of print element is it? Enter the number that corresponds to the type (1=ALL, 2=SEL, etc.), or type in all or a unique portion of the element type ("N" will do for "Numeric"; but "Al" is not acceptable since it could mean "ALL" or "ALPHA").

If the print element is a data item, check the file specifications printout for the type ("Amount Collected" is NUMERIC, "Number Sold" is INTEGER, "Name of Salesperson" is ALPHA, "Date Sold" is DATE, etc.). If the print element is a counter, do you want the record number relative to the file (ALL), or to the report (SEL)? If a literal, Analyst asks you to enter it.

DATA FILE ITEM NAME/NUMBER: Which data item do you want to print? Type the item name or number (data items are numbered from left to right across the record). Only a unique portion of the name

## Chapter 12: Design a Simple Report

need be entered. Data items do not have to be printed on the report in the same order they stand on the data record. The file specifications printout is a handy reference (Chapter 6).

PRINT IN COLUMN NUMBER: Enter the column to print the first character of the detail line print element. Analyst adds the length of the print item to the starting column to arrive at the next available print position, which it displays as the CURRENT VALUE for subsequent print elements. If a 20 character data item starts in column 1, the next available print position is column 21. You'll normally want to leave space between print elements, so add one or two to the CURRENT VALUE (check the report layout on your spacing chart).

ALL and SEL record counters take up 6 columns no matter how many records are on file. Literal print elements take up as many columns as there are characters in the literal value. ALPHA items take up columns equal to the maximum length of the data item. Numeric (NUM) and integer (INT) print elements occupy at least the number of characters specified as the maximum for the data item, plus additional columns to allow for commas, and the minus sign. DATE print elements always require 8 columns to print.

15. When the type, column, and data item information has been entered for each detail line print element, review your answers with RETURN, or press ESCAPE at any point to end this section. Press ESCAPE again to end this program and return to the Report Definition menu.
16. You've now defined a simple report. We strongly recommend making a printout of the report specifications by selecting #6, Print Report Definitions. This printout requires 132 column paper. Press ESCAPE at the Report Definition menu to return to the main menu.
17. To test your report format, adjust the paper in your printer, and print the report (if there is data in the data file) by selecting #4, Print a Report. When the printout is complete, remove it from the printer and check it carefully. When the starting column of a print element overlaps the previous print element, it is forced to the next line.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: Name the file that is to hold the report characteristics. Enter an (up to) 8 character filename. Analyst will append the three character filetype of RPT to it (Chapter 31 explains filenames and filetypes). Because you can define numerous reports on a single data file, each Report Definition File must have a different name. It is a good idea to give the file a name that helps you identify the report (DAILYBAL, EMPHIST, CUST1, CUST2, etc.).

To change a report format give the name of the Report Definition File. This request is not issued if you've created or modified a Report Definition File, or printed a report in the current run. Analyst assumes you want to edit the report definition file last used. The RPT file currently in use is displayed at the top of the Report Definition menu. If the assumption is not correct, return to the main menu and select #11, New Definition Files. Analyst will then ask for the name

of the Report Definition File to use when you select #3, Define a Report.

REPORT FILE NOT FOUND

CREATE ONE? (Y OR N): This request is normal when you create a new report definition file. If you receive it when you want to edit a report file created previously, you may have spelled the name wrong, or inserted the wrong disk in the DEFINITION FILE DRIVE (Chapter 5). If you type "Y", Analyst creates the new report file. If you type "N", the ENTER NAME OF REPORT DEFINITION FILE request is reasked. Enter the correct name, or press ESCAPE to quit.

NAME OF FILE DEFINITION FILE: The File Definition File (FIL file) holds the name of the data file to report on. Enter the (up to) 8 character filename. The three character filetype of FIL is assumed. The FIL file must already exist, although the data file it defines need not have been created yet.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu. Enter the desired selection and press RETURN. ESCAPE returns to the main Analyst menu. If the menu should become garbled, pressing RETURN refreshes it (needed rarely).

Standard Parameters Requests

PAGE WIDTH IN COLUMNS: Most printers are set to print 10 columns per inch. Unless you give a different response, Analyst assumes the page width is 132 columns. 8-1/2 x 11 paper is 85 columns wide. If you want to show the report on the video screen instead of printing it, the page width should be 80 columns or less (64 columns if you have the smaller screen size).

PRINT LINES PER PAGE: Most printers are set to print 6 lines per inch. Unless you give a different response, Analyst prints 60 lines per page. If you set the top-of-form on your printer 3 lines below the physical edge of the paper, and if the paper is 11 inches long, Analyst will leave a bottom margin of 3 lines. If you want the report to appear on the video screen instead of going to the printer, the lines to print per page should be 24 lines or less (16 lines for the smaller video screen).

DATE FORMAT (1=MM/DD/YY; 2=DD/MM/YY): You can print DATE items in the American (MM/DD/YY) or the international (DD/MM/YY) date format. Enter 1 or 2 respectively.

HARDCOPY? (Y OR N): Do you want to print the report, or show it on the video screen? The PAGE WIDTH IN COLUMNS parameter should not exceed the width of your video device if you want to show the report on the screen.

Detail Line Print Items, Etc.

NUMBER OF LOOKAHEAD ITEMS: This is an advanced topic covered in Chapter 21. Press RETURN if you just want to print a simple report.

Chapter 12: Design a Simple Report

NUMBER OF DETAIL LINES PER DATA RECORD: This is an advanced topic covered in Chapter 22. Press RETURN unless the number of columns taken up by the detail line print elements (including spaces) exceeds the number of columns to print per page (see Chapter 22).

DETAIL LINE NUMBER: n

NUMBER OF PRINT ELEMENTS FOR THIS DETAIL LINE: There are 8 kinds of print elements: ALPHA, NUMERIC, INTEGER, and DATE data items; LITERAL values; ALL RECS (prints the record number relative to the data file) or SEL RECS (prints the record number relative to the report); and ACCUMS (i.e., horizontal "accumulators"). Enter the number of elements to print on the detail line. Analyst later asks for the type (data item, literal, accum, or counter), length, and column to print of each.

For example, assume you want to print an inventory report that shows the stock number, description, number on hand, and value for each item. Assume this information is stored on a data file that includes other data (such as date last shipment received, retail price, etc.) that you do not want to print. You want a dollar sign to print in front of the dollar value, and the record number to print on the report also. If the data record has this structure:

ITEM NUMBER	DESCRIPTION	TYPE	LENGTH
1	Stock Number	ALPHA	6
2	Description	ALPHA	12
3	Retail Price	NUMERIC	9
4	Number on Hand	INTEGER	5
5	Value	NUMERIC	7
6	Last Shp. Re'vd	DATE	6

and you want the report to look like this:

SIMPLE INVENTORY REPORT				
Record No.	Stock Number	Description	On-Hand	Value
REC: 1	P-123	Large Widget	5	\$ 125.75
REC: 2	P-224	Small Leech	350	\$ 22.50
REC: 3	P-111	Dried Spoons	250	\$1,004.12
etc...				

you should specify 7 detail line print elements: 2 literals, 1 counter, and 4 data items (2 ALPHA items, 1 INTEGER item, and 1 NUMERIC data item). When asked to describe each detail line print element, start with the leftmost print element (the literal "REC:") and work right. In sum, the detail line print elements would be:

PRINT ELEMENT NUMBER	TYPE OF ELEMENT	LITERAL OR DATA ITEM	DATA ITEM NUMBER
1	LITERAL	REC:	
2	ALL RECS		
3	ALPHA	stock number	1
4	ALPHA	description	2
5	INTEGER	number on hand	4
6	LITERAL	\$	
7	NUMERIC	value	5

NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS (0-9): Enter the number of lines to skip between data records on the report (usually zero or one). When data records are printed on more than one detail line this feature improves readability.

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: This is an advanced topic covered in Chapter 23. Press RETURN for a simple report.

DETAIL LINE NUMBER: n

PRINT ELEMENT NUMBER: n

ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;5=INT;6=ALPHA;7=DATE;8=ACCUM):

Specify the type of print element by entering the appropriate number, or by typing all, or a unique portion of the description. If the print element type is ALPHA, you can enter "6", "ALPHA", "alpha", "ALP", "alp", etc., but not "AL" or "al" since this would not distinguish it from type #1, "ALL".

The print element types are summarized here:

ELEMENT TYPE	MEANING
1 ALL	Prints record number relative to all records on the data file
2 SEL	Prints record number relative to all records on the report
3 LIT	Prints a literal value you define
4 NUM	Prints a NUMERIC data item
5 INT	Prints an INTEGER data item
6 ALPHA	Prints an ALPHA data item
7 DATE	Prints a DATE data item
8 ACCUM	Prints a horizontal accumulator on the detail line

DATA FILE ITEM NAME/NUMBER: Issued when the type is NUMERIC, INTEGER,

## Chapter 12: Design a Simple Report

ALPHA, or DATE. Enter the data item number or name. If the print element is the third item on the data record, and the descriptive name is "Number On Hand", enter "3", "Number on Hand", "NUMBER ON HAND", "number on hand", or (if no other item name started with "Number") "number", "numb", etc. The spelling and punctuation must be exact for Analyst to recognize the data item you intend.

PRINT IN COLUMN NUMBER: What is the column number to begin printing the print element? Analyst helps you avoid overlapping print elements by calculating the next available column number and displaying it as the CURRENT VALUE. If print element #2 (say, an ALPHA item) has a maximum length of 25 characters and begins in column 10, print element #3 should begin in column 35 or higher. You'll want to leave space between print elements. Commas are counted for NUMERIC or INTEGER data items. DATE items require 8 columns to print. ALL and SEL record counters require 6 columns, even if fewer digits are anticipated.

ENTER LITERAL DATA: Issued when the print element is LITERAL. Type the literal value to print on the detail line. Analyst tells you how many columns it occupies.

### 13. Give Your Report Titles

Purpose: Titles make your reports more informative and readable. They identify your company or department, show the report name, tell you the date the report was printed, and identify each page with a page number. Report titles also label columns of data. Titles are not mandatory; if you do not run the Report Titles program, Analyst prints two "default" titles: "STRUCTURED SYSTEMS GROUP, INC.", and a blank line. This chapter explains how to define report titles. A special kind of title, called a "lookahead" title is covered in Chapter 21.

Background: The effect of printing one data record after another is to create columns of like data (names, dates, amounts, etc.), since each print element begins in the same position for each record. Of course the data changes from record to record:

REC:	1	P-123	Large Widget	5	\$ 125.75
REC:	2	P-224	Small Leech	350	\$ 22.50
REC:	3	P-111	Dried Spoons	250	\$1,004.12
REC:	4	P-114	Instant House	4	\$2,445.19
REC:	5	P-185	Blue Cows	15	\$ 998.25
			etc...		

Report titles are used to label these columns:

		ITEM NO.	DESCRIPTION	ON-HAND	VALUE
REC:	1	P-123	Large Widget	5	\$ 125.75
REC:	2	P-224	Small Leech	350	\$ 22.50
REC:	3	P-111	Dried Spoons	250	\$1,004.12
REC:	4	P-114	Instant House	4	\$2,445.19
REC:	5	P-185	Blue Cows	15	\$ 998.25
			etc...		

In addition to labeling columns, report titles can serve as report headings:

M U R R A Y ' S      G I F T      S H O P				PAGE	1
				DATE	06/25/81
INVENTORY REPORT					
		ITEM NO.	DESCRIPTION	ON-HAND	VALUE
REC:	1	P-123	Large Widget	5	\$ 125.75
REC:	2	P-224	Small Leech	350	\$ 22.50
REC:	3	P-111	Dried Spoons	250	\$1,004.12
REC:	4	P-114	Instant House	4	\$2,445.19
REC:	5	P-185	Blue Cows	15	\$ 998.25
			etc...		

## Chapter 13: Give Your Report Titles

When there are more records to print than will fit on a single page, Analyst begins a new page. Report titles print the same from page to page.

### HOW TO GIVE YOUR REPORT TITLES

1. For best results, design your report on graph paper. Pencil in the report titles directly, in the exact columns where you want them to appear (if the title is to be centered on a line by itself, you don't have to be so careful; Analyst will center it for you). Allow one column per character, including punctuation and spaces. It helps to show the detail line print elements (see Chapter 12) so you know where to put the column headings.
2. Now count up the number of titles. A title that is centered on a line by itself counts as one. A blank line counts as a single title. For no titles enter zero (0). If there are less than two titles, the date and page will not print on the report. Column headings can be counted individually, or as a single title. For example,

ITEM NO.	DESCRIPTION	ON-HAND	VALUE
----------	-------------	---------	-------

can be one title ("ITEM NO. DESCRIPTION ON-HAND VALUE"), or four titles ("ITEM NO.", "DESCRIPTION", "ON-HAND", and "VALUE").

If a column heading occupies more than one line, it cannot be counted as a single title. The number of titles in the example below could be counted as 2 or 6, but not 3:

EMPLOYEE	TIME	TIME
NAME	IN	OUT

3. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
4. Enter the number of titles on the report. Analyst asks for the starting column and content of each title. To center the title, enter zero (0) as the starting column.
5. Analyst does not ask for the line number to print a title. It knows to print a title on the following line if the starting position overlaps the previous title, or if the previous title is centered. If you want to print a title on the next line, but it does not overlap the previous title, you can extend the previous title to make it overlap by adding a sufficient number of blanks.
6. After answering the title requests, press ESCAPE to return to the Report Definition Menu, or RETURN to review or correct your answers.

MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND: See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu. Select #2 to define report titles. Press ESCAPE to return to the main menu. If the menu ever becomes garbled, press RETURN to refresh it (rarely needed).

NUMBER OF TITLES: The maximum is 50. A title centered on a line by itself counts as one. A blank line also counts as one title. A title need not be an individual word or symbol, and may contain any number of blanks (e.g., "NUMBER SOLD      DATE      AMOUNT" may be considered a single title if entered as one). The longest title allowed is 132 characters.

TITLE NUMBER: n

TITLE COLUMN POSITION (0=CENTERED): Asked once for each title you requested. Enter the column number to begin printing the title. If title #1 is 10 characters long and begins in column 20, title #2 should begin in column 30, or higher. Enter zero (0) to center the title. A centered title prints on a line by itself.

TITLE NUMBER: n

TITLE: Type the title to print, up to a maximum of 132 characters, including blanks and punctuation. If the length of the title exceeds your screen width, continue typing anyway. The title will "wrap around" to the next line. If a title has been entered previously, you can type in a NEW VALUE, or press RETURN to leave the CURRENT VALUE intact. You can set the CURRENT VALUE to a blank line by typing one or more blanks at the TITLE request (press the SPACE bar).

## 14. Sorting Your Data File

Purpose: Sorting organizes a file of data records according to a data item (or "sort key") common to all the records on the file. Typical sort keys are name, date, amount, or identification number. The order can be ascending or descending. Printing a report in alternate sort orders stimulates insights, reveals trends, or simply organizes data into a coherent pattern. One of the major advantages of electronic data processing is the ease with which information can be sorted.

This chapter explains how to sort a data file according to one sort key (for example, into order by zipcode). When a data file is sorted in this way, the Create or Modify a Data File program allows access to data records by a value in the "key field", in addition to the usual access by record number (see Chapter 9). Chapter 19 explains the use of "multiple sort keys" (used to organize a file by color within product, or name within territory). You don't have to know how to sort to print grand totals on a report, but you should refer to Chapter 19 if you want to print subtotals, or "lookahead" headings (see Chapter 21). The RANGE record selection condition (Chapter 16) does not require a sorted file.

These instructions assume you are sorting with SSG's QSORT. If you intend to sort with another program, refer to the documentation provided with it. Selection #7, Define Sort Parameters, and #8, Sort a Data File, should only be run if QSORT is used.

Background: Sorting a data file creates a new copy of it, which means disk space must be available to hold the unsorted version (the "input" file), the sorted version (the "output" file), and temporary "work files" created by the sorting process. The output file is always the same size as the input file, while the combined size of the work files is never larger than the input file. Chapter 32 explains how to calculate disk storage space. You won't see the work files under normal circumstances, but they occupy disk space nevertheless.

If your data file is very small (less than one-third of a disk, with no other large files on the disk) sorting is easy. The input, output, and workfile locations can all be the same (drive B, if that is where your data file is). This is the most likely situation when you are practicing with Analyst and the programs are on drive A.

If you have a four disk drive system, sorting even a full disk is easy. Assuming the Analyst programs are on drive A (including QSORT) and your data file is on B, the sorted (output) file could be assigned to C, with the workfiles assigned to D.

Sorting a full disk of data on a two drive system is a little more complicated. You'll need to prepare a special "SORT WORK DISK" that is empty except for QSORT.COM, and perform the sort outside the Analyst system. The work files should be assigned to A (where the SORT WORK DISK will reside). Drive B would hold the input file (the unsorted data file). But where should the output file be created? The answer is drive B, but on a physically different diskette. QSORT will prompt you to switch disks to receive the sorted output at the appropriate time, if you request the disk switching option.

Here are suggestions for handling other likely situations:

TWO DRIVE SYSTEM, DATA FILE LESS THAN 1/2 DISK, ROOM ON A FOR WORK FILES: A likely situation with "double density" disk drives (about 500K per drive). Assign input file to B, output file to B, workfiles to A. Disk switching not needed. Can sort directly from Analyst menu.

TWO DRIVE SYSTEM, DATA FILE OVER 1/2 DISK, ROOM ON A FOR WORK FILES: Not very likely since programs on A may not leave room for work files. Handle the same as above, but request disk switching option. Can sort from menu.

THREE DRIVE SYSTEM, DATA FILE LESS THAN 1/2 DISK, NO ROOM ON A FOR WORK FILES: Assuming data file is on B, assign work files to C and output file to B. Disk switching is not needed. Can sort from menu.

THREE DRIVE SYSTEM, DATA FILE OVER 1/2 DISK, NO ROOM ON A FOR WORK FILES: Same as above, except disk switching should be requested.

HARD DISK SYSTEMS: Sorting on a "hard disk" system is often very simple since there is usually plenty of storage space available. The same principles apply, except there is no need for disk switching. NOTE: When you run a sort from the Analyst menu, there must be a write-enabled disk with at least 2K available in drive A (if drive A is a floppy disk drive); this is where the SUBMIT file is built that controls the automatic sorting sequence (leave Analyst system, perform sort, return to Analyst).

Sorting a large number of records may take a few minutes. It is a good idea to watch the screen for error messages, at least at the start of the sort. Do not interrupt the sort (by removing your disks, or pressing RESET); a completion message appears when sorting is complete.

#### HOW TO SORT A DATA FILE

1. The exact procedure required depends on the size of the data file and the amount of disk storage available (see the Background section above).
2. The first step is to run the Define Sort Parameters program, which asks for the drive locations of the input, output, and work files, and for the order in which to sort the file. Your answers are stored on a "sort parameter file", which has a filetype of SRT (e.g., ZIPCUST.SRT). Once defined, the sort parameter file can be used over and over.
3. The next step is to get set up for the sort. If you need a "sort work disk" it should be prepared and placed in the specified drive. Arrange your other disks to conform to the sort parameters established in the previous step, if they are not already in the correct drives.

## Chapter 14: Sorting Your Data File

4. If the sort can be performed from the Analyst menu, call it up again (if you had to leave Analyst to get set up) and run #8, Sort Data File. If the sort must be run outside the Analyst system, execute it by typing a command similar to the example below:

```
A>QSORT B:ZIPCUST
```

where QSORT is assumed to be on drive A, and the sort parameter file named ZIPCUST.SRT is on drive B. The QSORT manual gives complete instructions.

5. Unless the output file was created on the same diskette as the input file, there is one more step before you can resume processing. If other files were on the input file disk (such as FIL, RPT, EXT, or SRT files), you should:
  1. Move those files over to the disk that contains the sorted (output) file (use PIP; see Chapter 31). Or,
  2. Erase the input file (unless you want to save it for backup), and move the output file onto the disk that held the input file. If you requested the backup option, the input file will have a last name of BAK.

### HOW TO DEFINE SORT PARAMETERS

1. Sort parameters need only be defined once to sort a particular data file into a particular order. Thereafter, the sort parameter file should only need to be changed if the name or drive location of the data file is changed, or if the file grows to a size that makes the specifications unworkable. Once a sort parameter file is defined, you only need to know its name to execute the sort.
2. Select #7, Define Sort Parameters. Enter the name of the File Definition File (FIL file) that defines the data file you want to sort. If you have created or used a FIL file during the current session, Analyst assumes this is the file to use and does not ask. If the assumption is wrong, select #11, New Definition Files, before selecting #7. If you've already selected #7, and the name of the data file displayed is not the one you want to sort, press ESCAPE to end the program (the program will ask if you want to return to the menu or end Analyst).
3. Next, name the "sort parameter file" (SRT file) that will store the responses (sort specifications) you are about to enter. Later you will give this name to execute the sort. If the SRT file is new the program asks for confirmation to create it.
4. Now state where QSORT should create the sorted output file, and what it should be named (see Background above). There are separate requests for the 8 character filename and the 3 character filetype. Although rarely needed, you can cause the sorted version to be named differently than the unsorted version. When the name of the output file is the same as the input file, the input file will be overwritten, unless you request that it be saved as a backup file at a later request. This is usually a good idea in case you encounter problems during the sort.

You can order the output file to be created on a disk drive that does not have sufficient disk space for it, if:

1. you request disk switching, and
  2. the work files are not assigned to the same drive as the output file.
5. State if you want various sorting statistics to print on the screen at the end of the sort. This option shows the number of records sorted, record size, number of sort keys, etc.
  6. State where the temporary work files should be created. If disk switching is requested they cannot be assigned to the same drive as the output file.
  7. The "sort keys" should be specified next. Instructions are provided here for sorting on a single key. Although the program will show "SORT KEY NUMBER: 2", for practical purposes this is the first key (the first key is used to sort the data file "header records" to the top of the file).
  8. Enter the name or number of the data item to be used as the sort key. The first sort key is called the "primary sort key" (also the "access key field"). For example, to sort the file by salesperson, you might respond by typing "Salesperson's Name", if that is the name of the data item.
  9. Unless you request otherwise, Analyst will sort the file using the entire data item as the key. What this means is that the last name "Morino" will sort after "Morina", which is what is normally wanted for names. But let's say you had defined a 7 character Product Code data item of the form:

VVMMNNN

where VV stood for vendor (e.g., GM for General Motors), MM for the model (e.g., CI for Chevrolet Impala), and NNN for the car number (e.g., car #054). If you wanted to sort the file by model of car (MM), you wouldn't want to sort on the whole data item, only part of it. If you only want to sort on part of a data item, or if you want the sort key to begin further into the data item than the first character, answer No when asked: DO YOU WISH TO SORT ON THE ENTIRE ITEM. Analyst will then ask for the position to start in the item, and the length of the sort key. In this example, you'd start in the third position, and the length of the sort key would be two characters.

10. State if the records should be sorted into ascending or descending order (i.e., A, B, C, D, ..., or Z, Y, X, ...; 1, 2, 3, ..., or 9, 8, 7, ...).
11. If you want lowercase letters to be treated the same as uppercase letters, request an ALPHA sort when asked ALPHA OR NUMERIC?. NUMERIC sorts lowercase letters after uppercase (i.e., "a" sorts after "Z"). An ALPHA sort handles numbers without problem. NUMERIC sorts data into priority according to the binary values of the ASCII character set, shown below:

## Chapter 14: Sorting Your Data File

[blank]		
!	0 - 9	a - z
"	:	{
#	;	
\$	<	}
%	=	~
&	>	
'	?	
(	@	
)	A - Z	
*	[	
+	\	
,	]	
-	^	
.		
/	~	

12. When requested to enter data for the next sort key, enter zero (0) to end (multiple sort keys are covered in Chapter 19). You can review your answers with RETURN, or press ESCAPE to end.
13. Before returning to the menu, the program asks if you want to print out the sort parameter specifications. We strongly recommend that you do so, to help you remember where the data files are expected when you run the sort. The report requires 132 column paper.

### HOW TO EXECUTE THE SORT

1. Unless you need a special work disk to sort (for example, with a two drive system, data file over one-half disk, and no room on A for the work files), you can initiate the sort from the Analyst menu. Check the printout of the sort parameters to make sure your disks are in the correct drives before you begin.
2. Select #8, Sort Data File. If you have created, modified, or used a Sort Parameter File during the current session, Analyst assumes this is the one you want (remember, the SRT file contains the name of the data file to sort). If the assumption is wrong, select #11, New Definition Files, before choosing #8. Analyst will then ask for the name of the SRT file to use.
3. The sort routine should begin immediately. Do not interrupt it, unless prompted to switch disks. Watch the screen for error messages, especially at the start. An OPEN ERROR usually means QSORT could not find the data file named on the specified disk drive. The sort routine ends Analyst automatically, performs the sort under the CP/M environment, then returns to Analyst. (Some CP/M compatible operating systems do not support the SUBMIT facility needed to sort from the menu, although most do. If yours does not, you must run the sort outside of the Analyst system.)
4. To sort outside the Analyst system you type QSORT followed by the name of the sort parameter file. If QSORT is on drive A, and the sort parameter file named EXAMPLE.SRT is on drive B, you would type:

A>QSORT B:EXAMPLE

The filetype of SRT is assumed. EXAMPLE is not necessarily the name of the data file; it is the name of the sort parameter file that tells QSORT what file to sort, and what order to sort it into.

MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: Type the (up to) 8 character filename of the FIL file that defines the data file you want to sort. This file must already exist and be on the DEFINITION FILE DRIVE (see Chapter 5). Not asked if a FIL file has been used during the current session.

NAME OF SORT PARAMETER FILE: Give the (up to) 8 character filename of the Sort Parameter File (SRT file) you want to create or edit. There can be any number of SRT files defined for a single data file, each one performing a different sort operation on the file (by zipcode, name, date, etc.). ESCAPE at this request ends the program. Not asked if a SRT file has been used in the current session.

SORT PARAMETER FILE NOT FOUND

CREATE ONE? (Y OR N; RET=N): Asked when you create a new SRT file, or if Analyst could not find the file you named on the DEFINITION FILE DRIVE (Chapter 5). If you answer Yes, the file is created; if No, the previous request is re-issued.

PREVIOUS PROGRAM ENDED ABNORMALLY

CONTINUE? (Y OR N): Asked when ESCAPE is entered at the previous request. Yes returns the menu. No ends the Analyst system, returning you to the CP/M environment. You can then look for the desired SRT file (with the DIR command), if you received the previous request unexpectedly.

OUTPUT FILE DRIVE: Where should the sorted version of the file be created? A-Z are valid drive names. RETURN assigns the output file to the same drive as the input file.

NAME OF OUTPUT FILE: Enter an (up to) 8 character filename to name the sorted version of the data file that will be created. Normally is the same name as the input (unsorted) data file (if the data file is named SALES.DAT, enter SALES).

FILE TYPE OF OUTPUT FILE: Enter the 3 character filetype to be given to the output file. It is normally the same as the input file (if the input file is named SALES.DAT, enter DAT). The filetypes BAK, FIL, EXT, RPT, SRT, ASC, OLD, FLO, and \$\$\$ are reserved and should not be entered.

BACK UP THE OUTPUT FILE? (Y OR N): Do you want to save the unsorted version of the file? This is important if the output file has the same name as the input file. If you answer Yes, the sorting program renames the input file to a filetype of BAK upon completion.

IF YOU ELECT TO CHANGE DISKS, THEN THE OUTPUT FILE  
MUST BE ON A DIFFERENT DISKETTE THAN THE WORK FILES.

CHANGE DISKS FOR WRITING OUTPUT FILE? (Y OR N): Do you want to switch disks  
(on the output file drive) to receive the sorted output on a

## Chapter 14: Sorting Your Data File

physically different disk than the one inserted when the sort begins? Answer Yes or No. See the Background section for an explanation of disk switching.

PRINT SORT STATISTICS ON CONSOLE? (Y OR N): A brief summary of sort statistics appears on screen after the sort if you request this option. Answer Yes or No.

TEMPORARY WORK FILE DRIVE (A-Z, RET=SAME AS INPUT FILE): Where should Analyst create the temporary work files needed during the sort? the combined size of the work files is never greater than the size of the input file. If you requested disk switching, the work files should not be assigned to the same drive as the output file. Valid responses are A through Z. RETURN assigns the workfiles to the same drive as the input file.

SORT KEY NUMBER: n

INPUT FILE ITEM NAME/NUMBER (0=END): Enter the name or number of the data item to use as the sort key. This request, and the four below, are asked for each sort key, until you enter zero in response to this request.

DO YOU WISH TO SORT ON ENTIRE ITEM? (Y OR N): Specify whether the records should be sorted into priority based on the entire length of the data item, or only part of it (see Step 9 under HOW TO DEFINE SORT PARAMETERS). Answer No if you only want to use part of the data item as the sort key, or if you do not want the sort key to begin with the first character of the data item. RETURN is the same as Yes.

NUMBER OF POSITIONS INTO ITEM TO START SORT KEY: Asked if you answered No to the previous request. Unless you want the sort key to begin with the first character in the data item (for example, if the data item is a product code of the form VVMMNNN, where MM is the desired sort key, the key begins in the third position), enter the desired starting position.

LENGTH FOR SORT KEY: Asked if you do not want to sort on the entire item. If the sort key length is not the length of the data item, enter the length desired. If, for example, the starting position of the sort key is 3, and the data item length is 10, the largest valid response is 8.

ASCENDING OR DESCENDING SORT ORDER (A OR D): Enter A for ascending order, or D for descending.

ALPHABETIC OR NUMERIC SORT (A OR N): Enter A if you want uppercase letters and lowercase letters to be treated the same. Answer N if you want letters, numbers, and symbols to sort into the priority established by the ASCII code chart.

DO YOU WANT A HARDCOPY OF THE SORT PARAMETERS? (Y OR N): Asked as you exit Define Sort Parameters. Answer Yes to print your answers (strongly recommended). Requires 132 column paper.

## 15. Adding Totals to the Report

Purpose: This chapter explains how to print totals at the end of your report--in effect, to add up columns of data. The report totals are printed on a "total line". Analyst lets you define the "total line print elements", which are called "accumulators". Subtotals are a separate topic covered in Chapter 20.

Background: It helps to understand how the computer prints the contents of a data file. Simply put, the computer "reads" the first record on the file, prints it, reads the next record, prints it, reads another record, and so on. As a record is read it can be tested to see if it meets predefined conditions ("record selection conditions", for example).

One kind of condition the computer can be instructed to recognize is a "level break". A level break is a change in the value of a data item from one record to the next. Analyst can be instructed to print a total line when it encounters a level break, for example, whenever the name changes in the Salesperson's Name data item, as it does every third record in the sample data file below:

Booker, Noel	810215	12.59
Booker, Noel	810216	14.75
Booker, Noel	810217	22.16
Drew, Nancy	810215	15.75
Drew, Nancy	810216	20.75
Drew, Nancy	810217	33.00
Clancy, David	810215	12.20
Clancy, David	810216	14.00
Clancy, David	810217	17.52

The ability to recognize when a change in value occurs makes it possible to print subtotals on reports, a topic covered in Chapter 20. This chapter explains a special kind of level break, a level break on the "end of file" (EOF). Specifying a level break on the End Of File causes Analyst to print a total line after the last data record has been printed.

A "total line" is defined much like a "detail line" (see Chapter 12). You state how many "print elements" you want, and specify the type, column to begin printing, and length of each. Total line print elements are called "accumulators". There are eight kinds of accumulators:

Chapter 15: Adding Totals to the Report

ALL	Prints the total number of records on the data file.
SEL	Prints the total number of records on the report.
LIT	Prints a literal value you define.
NUM	Prints the total of a numeric data item.
INT	Prints the total of an integer data item.
ALPHA	Moves an ALPHA value from last record read onto the total line.
DATE	Moves a DATE value from last record read onto the total line.
HOR. ACCUM	Prints the total of a horizontal accumulator (numeric or integer). See Chapter 23.

ALL, SEL, LIT, NUM, INT, and HOR. ACCUM. totals are readily understood, but in what sense can you "total" or "accumulate" an ALPHA or DATE data item? You can't add them up, of course, but you can print the value from the last record read before the level break occurred. The sample report below shows a total line with four accumulators (2 literal, 1 date, 1 numeric), which was triggered by an end of file level break:

WEEKLY COOKIE SALES REPORT		
SALESPERSON	DATE	AMOUNT
Booker, Noel	02/15/81	12.59
Booker, Noel	02/16/81	14.75
Booker, Noel	02/17/81	22.16
Drew, Nancy	02/15/81	15.75
Drew, Nancy	02/16/81	20.75
Drew, Nancy	02/17/81	33.00
Clancy, David	02/15/81	12.20
Clancy, David	02/16/81	14.00
Clancy, David	02/17/81	17.52
TOTAL SALES AS OF	02/17/81	= 162.72

Actually, the ability to "accumulate" ALPHA or DATE items is not as useful when printing a total line at the end of the report, as it is when subtotals are desired. In the example above, it makes sense to move the date onto the total line (since the file has been sorted into ascending order by date within salesperson), but it would not be particularly meaningful to move the salesperson's name ("Clancy, David") onto the total line.

HOW TO PRINT TOTALS AT THE END OF A REPORT

1. Totals are specified when you define a report, usually after you have defined the detail line print elements, but not necessarily (you can print the total of a data item that is not printed on the detail line).
2. Select #3, Define a Report. Enter the name of the Report Definition File to edit or create. If you have created or edited a Report Definition File, or printed a report in the current session, Analyst assumes that is the Report Definition File you want. If the assumption is wrong, select #11, New Definition Files, before selecting #3. If you've already selected #3, you can return to the main menu by ESCAPE, and select #11. When you select #3, Define a Report, Analyst will then ask for the name of the file to use. If the Report Definition File is NOT FOUND you may have misspelled the name, or it may not be on the disk in the DEFINITION FILE DRIVE (see Chapter 5). If you're creating a new file, the NOT FOUND message is normal.
3. When the Report Definition Menu appears, select #4, Level Breaks, Cross-Footing, and Accums.
4. At the ENTER NUMBER OF LEVEL BREAKS request, enter 1, since you only want level break processing to occur (that is, a total line to be printed) at one point--the End of File (EOF). Other types of level breaks, including multiple level breaks, are covered in Chapter 20. You are next asked to define Level Break #1.
5. When asked what data file items to "break on", enter zero (0), which means the level break processing should occur only at the end of the report (after the last data record has been read).
6. When asked HOW MANY TOTALS TO PRINT, enter the number of total line print elements (i.e., "accumulators" or "totals"). Analyst later requests information on each. For example, the WEEKLY COOKIE SALES REPORT shown above requires 4 totals: 1 numeric, 2 literal, and 1 date.
7. At the request for the number of "cross-foot" accumulators, press RETURN. This is an advanced topic covered in Chapter 24.
8. You can often make your reports easier to read by skipping one or more lines before printing the total line. Enter the number of lines to skip before printing the total line. Leave the number of lines to skip after the total line at zero, since the total line we are printing occurs at the end of the report.
9. For each total you ordered, Analyst requests the accumulator type, the data item to accumulate, the length of the accumulator, and the column to print. If the type is LITERAL, the program asks for the literal value. If you are accumulating a data item, the program asks when to "clear"; this request pertains to whether you want to keep running totals when specifying subtotals. Enter zero (0), for never, when specifying totals for an End Of File level break. See the section on MEANING OF REQUESTS AND VALID RESPONSES at the end of this chapter for the appropriate responses.
10. When all the requests have been answered, press ESCAPE to end, or RETURN to review or correct your answers. When the Report Definition

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Menu returns, press ESCAPE to return to the main Analyst menu.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND  
CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.  
Enter the desired selection, or ESCAPE to return to the main menu.  
Pressing RETURN refreshes the screen (rarely needed).

### Level Breaks, Cross-Footing, and Accumulator Requests

NUMBER OF LEVEL BREAKS: To print totals at the end of the report only, enter 1. Multiple level breaks and level breaking on other than the end of file are covered in Chapter 20.

LEVEL BREAK NUMBER: n  
BREAK ON DATA FILE ITEM NAME/NUMBER (-1=ALL RECS; 0=END OF FILE): To print totals at the end of the report, enter zero (0). See Chapter 20 for other kinds of level breaks.

HOW MANY TOTALS TO PRINT: Asked once for each level break you order. Enter the number of total line print elements (i.e., totals or accumulators) you desire to print. Specifying the number of totals to print on a total line is similar to specifying the number of detail line print elements. See Chapter 12 for an illustration of how to calculate the number of print items. The maximum number of totals any report may have is 50. (Do not include cross-foot accumulators in your count of totals to print; see Chapter 24.)

HOW MANY CROSS-FOOT ACCUMULATORS: Leave set to zero (0). This is an advanced topic covered in Chapter 23.

HOW MANY LINES TO SKIP BEFORE TOTALS (0-9; -1=NEW PAGE): Enter the number of lines to skip before printing the total line.

HOW MANY LINES TO SKIP AFTER TOTALS (0-9; -1=NEW PAGE): Enter the number of lines to skip after printing the total line. Not applicable when the only total line is at the end of the report (useful when printing subtotals).

ACCUMULATOR NUMBER: n. n OF n THIS BREAK.  
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM): This and the remaining requests are asked once for each total you requested. Enter the type of accumulator (total) beginning with the leftmost accumulator on the total line and working to the right.

To specify the accumulator type, enter the type number or name. You may enter a unique portion of the type name rather than the complete name (e.g., "L" for "LIT", "DA" for "DATE"; but not "AL" for "ALPHA" since it is not unique and would be confused with "ALL"). The

types are summarized below:

ALL	Prints the total number of records on the data file.
SEL	Prints the total number of records on the report.
LIT	Prints a literal value you define.
NUM	Prints the total of a column of numeric data.
INT	Prints the total of a column of integer data.
ALPHA	Moves an ALPHA value from the last record read onto the total line.
DATE	Moves a DATE value from the last record read onto the total line.
HOR. ACCUM	Prints the total of a horizontal accumulator (numeric or integer).

ENTER LITERAL DATA: When the accumulator is LITERAL, Analyst asks for the literal value (e.g., "TOTAL AMOUNT SOLD THIS MONTH="). The number of characters occupied by the literal value is displayed.

WHAT LEVEL BREAK TO CLEAR ACCUMULATOR (0=NEVER): When only a total line at the end of the report is desired, enter zero (0). Chapter 20 explains how to establish running totals, or reset totals at the desired point.

DATA FILE ITEM NAME/NUMBER TO ACCUMULATE: Asked if the accumulator totals a NUMERIC, INTEGER, DATE, or ALPHA data item. Enter the data item number, or a unique portion of the data item name.

ACCUMULATOR LENGTH: Enter the number of columns occupied by the total line print element. The accumulator length need not be equal to the maximum length of the data item (for example, if the Salesperson's Name item has a maximum of 30, but most names are less, you may enter 25 to save space). Note, however, that some types of accumulators require a fixed number of columns to print (ALL, SEL, and DATE):

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ALL	Must allow 6 characters minimum, no matter how many records are on the data file.
SEL	Must allow 6 characters minimum, no matter how many records are printed on the report.
LIT	Occupies as many columns as there are characters in the literal value.
NUM	Allow enough columns to print the number of digits in the expected total, plus commas, the decimal, and minus sign. A percent sign indicates an overflow.
INT	Allow enough columns to print the number of digits in the expected total, plus commas, and a minus sign.
ALPHA	Normally allow columns equal in number to the maximum length of the data item. If fewer are allotted, data is truncated on the right when necessary.
DATE	Dates always occupy 8 columns (MM/DD/YY or DD/MM/YY).

WHAT COLUMN TO PRINT ACCUMULATOR (0=NOT PRINTED): The first accumulator you define should be leftmost on the total line. Be careful not to overlap the print elements (if the second accumulator overlaps the first, it is forced to print on the line below). If accumulator number 3 starts in column 20 and occupies 10 columns, accumulator number 4 should begin in column 30 or higher. Use graph paper to make sure the print elements fit on the total line, do not overlap, line up under the desired columns of data (if possible or desirable), and have adequate spacing in between. The zero (0) NOT PRINTED option is a special option, see Chapter 24.

## 16. Printing Selected Records

Purpose: A report need not include all of the records on the data file. "Record selection conditions" may be specified during report definition to determine which records are included. You can use selection conditions to report on customers with outstanding balances over a given amount, prospects in a certain income range, profession, location, age group, marital status, etc. Or, you can use them to accept or reject specially "flagged" records (orders not received, bills not paid, etc.).

When records on the data file are to be tested against more than one selection condition, each condition is linked to the next by one of three "logical" conjunctions: AND, OR, or XOR ("exclusive OR"). Multiple selection conditions are explained in the Background section below. An example of their use might be: "Print a report on all doctors between 35 and 55 with two or more children, who drive autos of the model year 1978 or older. Also include anyone who drives a Cadillac."

Background: A record selection condition is a "test" performed on the content of a data item. If the value in the data item passes the test, the record is included on the report. There are four kinds of tests:

RANGE	Does the value fall within a range of alpha or numeric values?
MATCH	Does the value match a pattern you establish?
NOT RANGE	Does the value fall outside the range of values?
NOT MATCH	Is the value different than the match pattern?

A NOT RANGE condition selects records that would be rejected by the same RANGE criteria; a NOT MATCH condition selects records that would be rejected by the same MATCH pattern. A RANGE condition on a zipcode data item might have high and low values (inclusive) of 20000 to 29999 to select records with zipcodes in that range. A NOT RANGE condition with the same high and low values would select all records on the file, except those between 20000 and 29999 (i.e., 00000 to 19999, and 30000 to 99999)

You can combine up to 10 selection conditions, each joined to the next by AND, OR, or XOR conjunctions. Selection conditions A, B, and C might be joined as follows: A AND B OR C. A record is not selected or rejected until it has been tested against all of the conditions, so even if condition A was not met, the record might still be selected (if C was met). Given that A was not met, B was met, and C was met, the string of conditions would be evaluated as follows:

A = condition not met  
A AND B = condition not met  
(A AND B) OR C = condition met, record selected

In general, an OR conjunction is satisfied if either or both of the surrounding conditions are met (as above). An AND conjunction is satisfied only if both surrounding conditions are met (they are not met in the example above). An XOR conjunction ("exclusive OR") is satisfied if one or

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the other, but not both surrounding conditions are met.

Here is a more complex example. Assuming the data file contained the necessary information, entered or coded in a consistent and appropriate manner, the following example illustrates the use of multiple selection conditions:

"Print a report on all doctors between 35 and 55 with two or more children, who drive autos of the model year 1978 or older. Also include anyone who drives a Cadillac."

The report would require five selection conditions:

CONDITION:	1	2	3	4	5
TYPE:	MATCH	RANGE	RANGE	RANGE	MATCH
DATA ITEM:	Profession	Age	Children	Auto Year	Auto Make
MATCH DATA:	DOCTOR				CADILLAC
RANGE LO-HI:		35-55	2-20	1940-1978	
CONJUNCTION TO NEXT COND:	AND	AND	AND	OR	

The chart below shows several records from the data file, and whether they would be selected:

RECORD NO.	PROFESSION	AGE	NUMBER OF CHILDREN	AUTO YEAR	AUTO MAKE	SELECTED?
1	DOCTOR	42	3	1975	BUICK	YES
2	DOCTOR	36	2	1979	CADILLAC	YES
3	LAWYER	54	4	1974	VOLVO	NO
4	DENTIST	28	0	1980	CADILLAC	YES

Let's look at record number 2 to see how it would be evaluated:

RECORD NUMBER:	2				
CONDITION NUMBER:	1	2	3	4	5
CONDITION MET?:	YES	YES	YES	NO	YES
CONDITION/CONJUNCTION:					SATISFIED?
1					YES
1 AND 2					YES
(1 AND 2) AND 3					YES
((1 AND 2) AND 3) AND 4					NO
(((1 AND 2) AND 3) AND 4) OR 5					YES

Now let's look at record number 4:

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RECORD NUMBER:	4				
CONDITION NUMBER:	1	2	3	4	5
CONDITION MET?:	NO	NO	NO	NO	YES
CONDITION/CONJUNCTION:			SATISFIED?		
1			NO		
1 AND 2			NO		
(1 AND 2) AND 3			NO		
((1 AND 2) AND 3) AND 4			NO		
(((1 AND 2) AND 3) AND 4) OR 5			YES		

Don't think that just because the first condition is not met, the record will not be selected. The entire set of conditions is resolved before Analyst accepts or rejects a data record for inclusion on the report.

When selecting by MATCH, the match pattern (or "match data") you specify must match the value in the data item exactly for the condition to be met. Upper and lower case letters must match, also punctuation and spacing. (It pays to enter data carefully and consistently.) You can specify a "partial match pattern" such as "Bo", which would select the names "Borden", "Bosch", "Bosco", "Boswell", and "Bowman". In like manner, the match pattern "B" selects all records beginning with "B" in the data item.

"Wild cards" may also be included in the match pattern, which allows you to match a value that begins further into the data item than the first position. Let's say you've defined a 7 character Product Code of the form "VMMNNN", where VV stands for vendor, MM for model, and NNN for auto number (e.g., "GMCI054", for General Motors, Chevrolet Impala, #054), and that you want the report to include all records for Chevrolet Impalas (that is, MM equal to CI). Assuming that you purchased Chevrolet Impalas from vendors in addition to General Motors, the match pattern below would do the trick:

??CI

There are three wild cards you can use:

?	Matches alphanumeric characters or symbols
#	Matches numbers
!	Matches upper and lower case letters

RANGE selection can be numeric, alphabetic, or by date (for example, A-Z, b-g, Borden-Mor, C-Culler, 12-225, 4/1/80-11/14/80, etc.). The high and low range values can be partial (e.g., "C" through "Culler"), but there is no wild card matching with the RANGE facility. Note also that upper and lower case letters are treated differently, which means that if the range is "A" through "Z", the value "culler" would not be selected if the data file consisted of the following names:

## Chapter 16: Printing Selected Records

Allen  
Baker  
culler  
Davis  
Ernst  
etc...

The data file need not be sorted for selection by RANGE.

### HOW TO SELECT RECORDS FOR PRINTING

1. Record selection conditions are specified when you define your report. Once established, they continue in effect until you alter the Report Definition File (RPT file).
2. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
3. When the Report Definition Menu appears, select #5, Record Selection Criteria.
4. Enter the number of selection conditions. The maximum is 10. If you're just practicing, we suggest you start with one.
5. For each selection condition, state the data item to test for the RANGE or MATCH fit. For example, to select records that fall within a certain zipcode range, enter "Zipcode", if that is the name of the data item. You may also enter the data item number.
6. For each selection condition, state what type it is: RANGE, MATCH, NOT RANGE, or NOT MATCH.
7. If the condition is RANGE or NOT RANGE enter the high and low values (inclusive). Remember that a NOT RANGE condition selects records that a similar RANGE condition would reject. If the condition is MATCH, enter the match pattern at the MATCH DATA request.
8. If you requested more than one selection condition in Step 4 above, enter the conjunction to the condition that follows. Choose between AND, OR, and XOR. See the Background section for an explanation of multiple selection conditions.
9. After defining each of the selection conditions press RETURN to review or correct your answers, or ESCAPE to return to the Report Definition Menu.
10. Press ESCAPE at the Report Definition Menu to return to the main Analyst menu.
11. When you print the report (see Chapter 17) only the records that meet

the selection conditions will be included. Depending on the purpose of the report, you may want to change the selection conditions frequently, or leave them the same. Additional Report Definition Files (RPT files) could be defined that differ only in their selection criteria.

MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND  
CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.  
Enter 5 to define record selection criteria. ESCAPE returns you to the main Analyst menu. RETURN refreshes the screen (rarely needed).

NUMBER OF SELECTION CONDITIONS: Enter the number of selection conditions for the report up to a maximum of 10. The information below is requested for each.

SELECTION CONDITION NUMBER: n  
FILE ITEM TO SELECT ON: Which data item should be tested for the RANGE, MATCH, NOT RANGE, or NOT MATCH fit? Enter the data item name or number (a unique portion of the data item name is also accepted). Check your printout of the data file specifications (see Chapter 6).

CONDITION TYPE: 1=RANGE;2=MATCH;3=NOT RANGE;4=NOT MATCH: Which test do you want to perform on the data item? Enter the type number (1-4) or name ("match", "NOT RANGE", etc.). Selection conditions are explained in the Background section.

MATCH DATA: Asked if the condition is MATCH or NOT MATCH. Enter the desired match pattern. Upper and lower case letters, punctuation, and spacing should be exact. Your match pattern may be a partial value, but it should never be longer than the maximum length of the data item. Wild card symbols (? = any alphanumeric or symbol, # = any number, ! = any upper or lower case letter) may be included in the match pattern (see the Background section). The first character of the match pattern is compared against the first character of the data item.

Matching on integer or numeric data is based on value and not form. Thus, the match pattern "5" would select "5.00" and "5.0".

To match on a date, simply enter the desired date in the appropriate form (MM/DD/YY or DD/MM/YY). You don't need to include leading zeros for single digit days or months. All records with that date will be selected.

If for some reason you need to match on one of the wild card symbols themselves (that is, treat them as ordinary data), precede each such wild card symbol in the match pattern with a backslash (\). For example, to select records that contain "#?" as data, you would give the match pattern "\#\?".

Chapter 16: Printing Selected Records

LOW RANGE: Asked if the condition is RANGE or NOT RANGE. Enter the starting value. High and low range values are inclusive. It may be a number, letter (or letters), or date. As with the MATCH facility, numeric and integer data is tested by value, not form. Dates may be entered in MM/DD/YY or DD/MM/YY form. Partial values may be specified for alphabetic range selection (e.g., "Start selecting with names that begin with C and continue through the name Muller"). Note that upper and lower case letters are treated differently; thus, "aa" would not be selected if the range were given as "AA to ZZ". You can of course define two selection conditions, linked by OR, one for upper case values, and one for lower case.

HIGH RANGE: Asked if the condition is RANGE or NOT RANGE. Enter the ending value. See the LOW RANGE request above for valid responses.

CONJUNCTION TO NEXT CONDITION (1=OR; 2=AND; 3=XOR): Asked when you request more than one selection condition for the report. See the Background section for how selection conditions linked by conjunctions are resolved. Enter the number that corresponds to the desired conjunction (1-3), or enter the type name ("or", "AND", "Xor", etc.). In summary:

OR	Conjunction is satisfied if either or both of the surrounding conditions are met.
AND	Conjunction is satisfied only if both surrounding conditions are met.
XOR	"Exclusive OR"; Conjunction is satisfied if one or the other, but not both of the surrounding conditions are met.

## 17. Print Your Report

Purpose: After you define the report format you can print the report. You can print the report on the printer ("hardcopy") or show it on your video screen (see Chapter 12). To print a report, you only need to know the name of the Report Definition File (the 8 character "first name" of the file that defines the report format).

Background: Because you can define numerous reports on a single data file, Analyst asks for the name of the Report Definition File, not the name of the data file. The Report Definition File contains the name of the data file to report on.

If you have any doubts, make sure the disks are in the proper disk drives before you begin. The File Definition (FIL) and Report Definition (RPT) files should be in the DEFINITION FILE DRIVE (Chapter 5). The data file may be expected on a different disk drive; check your printout of the report specifications.

Analyst begins printing the report where you have set the "top-of-form" on your printer (see the instruction manual for your printer), so you may want to set the top-of-form two or three lines below the physical top of the page. Analyst will print the number of lines established during report definition (see Chapter 12), then skip to the top of the next page. Be sure your answer to the PRINT LINES PER PAGE request is not larger than the number of lines that will fit on a page. Most printers are set to print 6 lines per inch.

Since there is no provision for "spooling" (i.e., saving) a report to disk, if you want to print the same report later, you should copy the data and definition files onto a blank disk. Label the disk with the name of the report, and the date. Be careful not to confuse it with your current data disk.

### HOW TO PRINT A REPORT

1. Turn on the power to your printer, load it with the right size paper, and set the top-of-form at the desired position. Make sure the paper is aligned evenly with the proper amount of slack. Hit the "form advance" at least once to test it.
2. Insert your disks in the drives where they are expected. The data file should be in the drive specified during data file definition. Check the printout of the report or data file specifications if you're not sure.
3. Call up the Analyst menu (see Chapter 5).
4. Select #4, Print a Report, and enter the name of the Report Definition File that defines the report you want to print. Enter the "first" name only (the up to 8 character filename). Printing should begin immediately. Print a Report "slews" (i.e., advances) one form before starting to print.

If you have created or edited a Report Definition File, or printed a report in the current session, Analyst assumes that is the Report Definition File you want. If the assumption is wrong, select #11, New

## Chapter 17: Printing Your Report

Definition Files, before selecting #4. If you've already selected #4, you can abort the printout by pressing any key on the console keyboard. When you get back to the main menu, select #11. When you select #4, Print a Report, Analyst will then ask for the name of the file to use. If the Report Definition File is NOT FOUND you may have misspelled the name, or it may not be on the disk in the DEFINITION FILE DRIVE (Chapter 5).

5. If you set up the report to print on the video screen, it will show one "page" (i.e., screenful) at a time, if the number of lines to print per page was set properly during report definition. Press RETURN to page through the report one screenful at a time. When all the records have been displayed, the menu returns. You can abort the display at any point by pressing any key on the keyboard, except RETURN.

### HOW TO ABORT A PRINTOUT

If the paper in your printer starts to jam, or if you want to stop a long printout, you can "abort" the Print a Report program by pressing any key on the console keyboard. The program will ask for confirmation to end the printout:

PRESS ESCAPE KEY TO END  
OR RETURN TO CONTINUE

If you press RETURN (say, after fixing the paper alignment) the report continues where it left off. If you press ESCAPE (followed by RETURN), the menu returns, with no harm to your data file.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: Type the (up to) 8 character filename of the Report Definition File you want to use. This is not necessarily the same as the name of your data file. Make sure you spell the name correctly. You may use either upper or lower case letters.

ENSURE THAT PRINTER IS TURNED ON, THEN PRESS RETURN TO BEGIN: Press RETURN to begin printing the report. (Not asked if the report is to be printed on your video device.)

## 18. Querying the Data File

Purpose: The Analyst Enquiry program searches your data file for records that meet selection conditions you define. It is a quick way to locate selected records for analysis. Since the data is displayed exactly as it is stored on the file, there is no need to define titles, detail line print elements, etc.

Background: The Enquiry program selects data records for display using "selection conditions" you define. Selection conditions are defined in the Enquiry program in the same way they are defined for a report. See Chapter 16 for how to use selection conditions.

The CP/M "CONTROL-P" facility can be use in conjunction with the Enquiry program to produce a quick "hardcopy" report. After you define the desired selection conditions, but before you press ESCAPE to begin the search and display, give the command CTRL-P (hold down the CONTROL key and press the letter "P" once). Of course, your printer should be on and ready to go. The data records displayed on your screen will also appear on the printer. To "turn off" the CONTROL-P, give the command again before continuing (it should be accepted at any request).

### HOW TO USE THE ENQUIRY PROGRAM

1. Enter the (up to) eight character filename of the File Definition File that defines the data file you want to search.
2. Enter the number of selection conditions you desired for this enquiry.
3. Define each selection condition (see Chapter 16) by stating the data item to select on, whether the condition is RANGE, MATCH, NOT RANGE, or NOT MATCH condition, and by entering the match pattern or range values.
4. Press RETURN to review or correct your answers, or ESCAPE to begin the display of selected records. If you want a hardcopy printout, give the CTRL-P command before you press ESCAPE.
5. Data records selected for display will "scroll" up the video screen. If you wish to stop the display temporarily to examine a record, give the command CONTROL-S at any point. To restart the display, give the command CTRL-S again.
6. You can repeat the enquiry process by answering "Y" or "yes" at the request, ARE THERE FURTHER SELECTION?, or return to the Analyst menu by typing "N" or "no".

## Chapter 18: Querying the Data File

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF FILE DEFINITION FILE: Type the up to 8 character "first name" of the file that defines the data file you want to search.

NUMBER OF SELECTION CONDITIONS: The maximum number allowed is 10. See also Chapter 16.

SELECTION CONDITION NUMBER: n

FILE ITEM TO SELECT ON: Which data item should be tested for the RANGE, MATCH, NOT RANGE, or NOT MATCH fit? Asked once for each selection condition you requested. See also Chapter 16.

CONDITION TYPE: 1=RANGE;2=MATCH;3=NOT RANGE;4=NOT MATCH: Which test do you want to perform on the data item? See also Chapter 16.

MATCH DATA: Enter the desired match pattern for the MATCH or NOT MATCH condition. See also Chapter 16.

LOW RANGE: Enter the low value for the RANGE or NOT RANGE condition. See also Chapter 16.

HIGH RANGE: Enter the high value for the RANGE or NOT RANGE condition. See also Chapter 16.

CONJUNCTION TO NEXT CONDITION: 1=OR;2=AND;3=XOR: Asked if multiple selection conditions are requested. See Chapter 16, especially the Background section, for an explanation of multiple selection conditions.

HIT ESCAPE TO EXIT SELECTION ROUTINE

OR RETURN TO CHANGE CONDITIONS: To begin the search and display, press ESCAPE (followed by RETURN). Press RETURN to review or correct your answers. To send the display to your printer, give the CONTROL-P command before you enter ESCAPE.

ARE THERE FURTHER SELECTIONS? (Y OR N): Asked after the enquiry is complete. Type Yes to repeat, or No to end. If you used the CTRL-P facility to make a hardcopy report, give the command again before answering this request in order to turn off "echoing" to the printer.

## 19. More On Sorting Your Data File

Purpose: This chapter explains how "multiple sort keys" can be used to organize data records into more complex sort orders. Beyond making reports more informative, files sorted by multiple keys permit several levels of subtotals to be printed (Chapter 20), the use of "look ahead" titles (Chapter 21), and more complex mathematical functions (Chapter 23 and 24).

Background: The concept of "multiple sort keys" may seem difficult at first, but in fact it is not a hard subject to grasp. Simply put, multiple sort keys allow you to organize a file of data records by name within date, color within product, sales by salesperson within region, etc. (It is important to remember that records are almost always added to a data file in random order; see Chapter 8). Imagine a file of data records entered in random order, such as the following:

Region 1	Allen, A.	Product A	100
Region 2	Brown, B.	Product C	50
Region 2	Allen, A.	Product C	110
Region 1	Allen, A.	Product B	40
Region 2	Brown, B.	Product B	250
Region 1	Brown, B.	Product B	200
Region 1	Allen, A.	Product C	125
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product A	50
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product C	160
Region 2	Brown, B.	Product A	100

(Example 19.1)

If we sorted the file on a single sort key (see Chapter 14) by region, the file would look like this:

Region 1	Allen, A.	Product A	100
Region 1	Allen, A.	Product B	40
Region 1	Brown, B.	Product B	200
Region 1	Allen, A.	Product C	125
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product C	160
Region 2	Brown, B.	Product C	50
Region 2	Allen, A.	Product C	110
Region 2	Brown, B.	Product B	250
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product A	50
Region 2	Brown, B.	Product A	100

(Example 19.2)

This is better, but still not ideal. Sorting the file into order by product within name within region, would require three "sort keys": the first on region, the second on name, the third on product. The result would look like this:

## Chapter 19: More On Sorting Your Data File

Region 1	Allen, A.	Product A	100
Region 1	Allen, A.	Product B	40
Region 1	Allen, A.	Product C	125
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product B	200
Region 1	Brown, B.	Product C	160
Region 2	Allen, A.	Product A	50
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product C	110
Region 2	Brown, B.	Product A	100
Region 2	Brown, B.	Product B	250
Region 2	Brown, B.	Product C	50

(Example 19.3)

Of course, we need not have sorted the file into this order. It is equally possible to sort by region within name within product, as below:

Region 1	Allen, A.	Product A	100
Region 2	Allen, A.	Product A	50
Region 1	Brown, B.	Product A	75
Region 2	Brown, B.	Product A	100
Region 1	Allen, A.	Product B	40
Region 2	Allen, A.	Product B	30
Region 1	Brown, B.	Product B	200
etc.....			

(Example 19.4)

The order in which sort keys are defined in the Define Sort Parameters program determines their "priority". In Example 19.4 product has the highest sort priority, name is next, region is third. In Example 19.3 region has the highest sort priority, name is second, and product is third. You will find that the order in which sort keys are defined (i.e., sort key priority) is important when several levels of subtotaling are desired for a report (see Chapter 20).

### HOW TO DEFINE MULTIPLE SORT KEYS

1. Run the Define Sort Parameters program to create the desired "sort parameter file". See Chapter 14 for a complete explanation of sorting procedures.
2. Specify up to 4 sort keys by answering the requests described in Chapter 14.
3. Perform the sort as described in Chapter 14. The result should be a data file with records organized according to the sort parameter specifications.

### MEANING OF REQUESTS AND VALID RESPONSES

See Chapter 14.

## 20. More On Totals and Subtotals

Purpose: Chapter 15 explained how to add up columns of data at the end of your report. This chapter explains how to print subtotals at desired points in the report. The concept of a "total line" and "accumulators" was treated in Chapter 15. Chapter 15 also introduced the idea of a "level break". Refer to those chapters if you need to. Since meaningful subtotalling requires sorted files, you may want to refer to Chapters 14 and 19 also.

Background: Recall that for totals to be printed a "level break" has to occur. A level break is said to occur when the value in a given data item changes from one record to the next. (Chapter 15 described a special kind of level break, one that occurs when the end of the data file is reached.) You can request Analyst to "monitor" one or more data items as it prints records, and cause totalling to take place when it discovers a change in value.

The values in some data items change frequently, often differing in every record (e.g., amount collected, number sold). For some data items the values change only within an expected range of possibilities (e.g., product code, region, date, name). Monitoring the former type of data item generally gives meaningless results since the value changes with each record read. Monitoring the latter type can be very useful, however. Doing so allows you to print a "total line" when the product changes (for totals by product), when the region changes (for totals by region), or when the salesperson changes (for totals by salesperson).

Consider the data file shown in Example 20.1. Notice how the values in data item 1 (region) are the same for the first six records, but that the values in data item number 4 (number sold) change with each record:

Region 1	Allen, A.	Product A	100
Region 1	Allen, A.	Product B	40
Region 1	Allen, A.	Product C	125
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product B	200
Region 1	Brown, B.	Product C	160
Region 2	Allen, A.	Product A	50
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product C	110
Region 2	Brown, B.	Product A	100
Region 2	Brown, B.	Product B	250
Region 2	Brown, B.	Product C	50

(Example 20.1)

To print the total number sold in each region, you would request a level break "on" data item number 1, and define what elements to print on the "total line" for that level break. Your total line might take the following form:

TOTAL NUMBER SOLD FOR: [data item #1] = [data item #4]

which would require two literals ("TOTAL NUMBER SOLD:" and "="), one ALPHA accumulator, and one INTEGER accumulator. As the Print a Report program read and printed records from the data file it would monitor data item #1

## Chapter 20: More On Totals and Subtotals

for a change in value. After reading the first record for Region 2, but before printing it, the program would print the total line with the appropriate values filled in. After printing the total line Analyst resumes printing data records. A total line is also printed when there are no more data records (since the value in data item #1 changes from "Region 2" to nothing). The report might look like the one below:

Region 1	Allen, A.	Product A	100
Region 1	Allen, A.	Product B	40
Region 1	Allen, A.	Product C	125
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product B	200
Region 1	Brown, B.	Product C	160

TOTAL NUMBER SOLD FOR: Region 1 = 700

Region 2	Allen, A.	Product A	50
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product C	110
Region 2	Brown, B.	Product A	100
Region 2	Brown, B.	Product B	250
Region 2	Brown, B.	Product C	50

TOTAL NUMBER SOLD FOR: Region 2 = 590

(Example 20.2)

This example shows how important it is for your data file be in the proper sort order for meaningful subtotalling to take place. Imagine what would happen if you tried to produce the same report on the data file shown in Example 19.1. Sorting is covered in chapters 14 and 19.

For the same reason, it is important that data be entered consistently and spelled correctly when you add records to the file. Because computers are so literal (an observation you've no doubt heard many times) it will treat "Region 2", "REGION 2", and "Regoin 2" as different values. The computer has no way of knowing what you intended. A certain amount of editing may be needed to make the information consistent. It also helps to code information instead of storing it in spelled-out form; assigning "BL" to the color blue, for example, limits the chance that one data entry clerk will enter it as "BLUE", another as "Blue", and a third as "blue".

Sometimes you may want several different subtotals on a report. Taking the example above, you may want a report that shows number sold by salesperson within each region, plus a grand total for all regions. This would require "multiple level breaks". For each level break requested you define a different total line. Each level break monitors a different data item and prints its associated total line when a change in value is detected.

For example, one level break would monitor the "Name" data item and print a subtotal whenever the name changed. Another would monitor the "Region" data item and print a subtotal whenever the region changed. A third would print grand totals for the file when end of file was reached. To print such a report the data file should be sorted by name within region (as in the example) to achieve the desired results.

When multiple level breaks are used, the order in which they are defined to the report definition program is important. The higher the "level break number", the higher its "priority"; the first one defined is Level Break #1, the next is #2, etc. When a change in data item value occurs for a higher priority level break, total lines are printed for the lower priority level breaks, before the total line for the higher break is printed. In our example, the level break on region should have higher priority than that on name, and thus should be defined second. Simply put, when region changes, the salesperson totals are printed before the region totals (even if there is no change in the name data item). The report might look like this:

Region 1	Allen, A.	Product A	100
Region 1	Allen, A.	Product B	40
Region 1	Allen, A.	Product C	125
TOTAL NUMBER SOLD BY:		Allen, A. =	265
Region 1	Brown, B.	Product A	75
Region 1	Brown, B.	Product B	200
Region 1	Brown, B.	Product C	160
TOTAL NUMBER SOLD BY:		Brown, B. =	435
TOTAL NUMBER SOLD FOR:		Region 1 =	700
Region 2	Allen, A.	Product A	50
Region 2	Allen, A.	Product B	30
Region 2	Allen, A.	Product C	110
TOTAL NUMBER SOLD BY:		Allen, A. =	190
Region 2	Brown, B.	Product A	100
Region 2	Brown, B.	Product B	250
Region 2	Brown, B.	Product C	50
TOTAL NUMBER SOLD BY:		Brown, B. =	400
TOTAL NUMBER SOLD FOR:		Region 2 =	590
TOTAL NUMBER SOLD FOR ALL REGIONS:			1,280

(Example 20.3)

To achieve the desired results, the sort keys should correspond to the level break priority. That is, the primary sort key should be the highest priority level break data item, the secondary sort key should be the next highest priority level break data item, etc.

#### HOW TO PRINT SUBTOTALS ON YOUR REPORT

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When the Report Definition Menu appears, select #4, Level Breaks, Cross-Footing, and Accumulators.

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3. Enter the number of level breaks desired. This is a request for the number of data items you want to test for a change in value, and thus, for the number of different total lines you want to print. (It is not a request for the number of times a given total line will print; that depends on how many times the value changes in the data item being monitored.) Add any special level breaks, such as on "end of file" or on "all records".
4. For each level break requested, give the data item to be monitored for change, the number of totals (i.e., accumulators) to print when a change is detected, and other information (number of lines to skip before and after total line, number of "cross-foot" accumulators if you want to perform mathematical functions on the total line; see Chapter 24).
5. For each "total" requested (in effect, for each "total line print element"), state its type, when to clear it, its length, and where to print it on the page. Defining total line print elements is described in Chapter 15.
6. After answering all the requests, press RETURN to review or correct your answers, or ESCAPE to return to the Report Definition Menu. It is a good idea to print the report specifications (selection #6), and then the report itself to check the correctness of your answers. You can edit the Report Definition File to change your answers if you get unexpected results.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.

Enter 4 to define level breaks and accumulators. ESCAPE returns you to the main Analyst menu. RETURN refreshes the screen (rarely needed).

NUMBER OF LEVEL BREAKS: Enter the number of data items you want to monitor for a change in value, which is, in effect, the number of different total lines you want to print. (This is not the same as the number of times a given total line will print on a report; that is determined by how often the data item changes.) Include any special level break processing you want, such as on the "end of file" (for report totals), or on "all records" (for example, to print a line of dashes between each data record). The maximum number is 10.

LEVEL BREAK NUMBER: n

BREAK ON DATA ITEM NAME/NUMBER: Asked for each level break. If more than one has been requested, enter instructions for the lowest priority level break first (the "all records" level break has the lowest priority of all). For example, to print subtotals by salesperson within region (see Example 20.3), the level break on salesperson should be defined before the level break on region. Enter the name or

## Chapter 20: More On Totals and Subtotals

number or the data item to be monitored. Enter zero (0) for End Of File or "-1" for All Records.

**HOW MANY TOTALS TO PRINT:** Asked for each level break. Enter the number of print elements on the total line. The terms "total", "print element", and "accumulator" are used interchangeably throughout this chapter, and most of the documentation. A maximum of 50 "totals" may be specified for a report (note: this maximum is not per level break total line).

**HOW MANY CROSS-FOOT ACCUMULATORS:** This is an advanced topic covered in Chapter 24. Enter zero, or leave set to zero by pressing RETURN. A "cross-foot" accumulator is similar to a "horizontal" accumulator, but it prints on the total line instead of the detail line.

**HOW MANY LINES TO SKIP BEFORE TOTALS (0-9;-1=NEW PAGE):** To enhance readability, you can skip a few lines before printing totals. You can even print the total line on the next page. Enter the number of lines to skip between zero and 9, or enter "-1" to print totals on the next page.

**HOW MANY LINES TO SKIP AFTER TOTALS (0-9; -1=NEW PAGE):** How many lines do you want to skip before Analyst resumes printing data records? You can resume printing data records on the page following the total line. It is possible to print mailing labels by setting the physical page length on your printer equal to the distance between labels, requesting a level break on every record (specify zero totals), then skipping to the next "page" after "printing" the total line (see Chapter 22).

**ACCUMULATOR NUMBER n. n OF n THIS BREAK**  
**ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;5=INT;6=ALPHA;7=DATE;8=HOR. ACCUM):**  
Asked for each total to be printed on the total line. Each accumulator (i.e., total) on the report is assigned a number. The relative position of the accumulator on the total line appears to its right. See Chapter 15 for how to define an accumulator.

**ENTER LITERAL DATA:** Asked when the accumulator is LITERAL. See Chapter 15.

**WHAT LEVEL BREAK TO CLEAR ACCUMULATOR:** Most often you'll want to clear (reset) the accumulator on the same level break that triggered the totalling. That is, if you're printing total sales for the region, you will want to reset the accumulator to zero when you begin a new region. If level break number two prints the totals for the region, that is the number of the level break to enter.

When a total line is printed on a change of date, running totals are common. If you're printing sales by date within region, you may not want to clear the accumulator when the date changes, but when the region changes.

**DATA FILE NAME/NUMBER TO ACCUMULATE:** See Chapter 15.

**ACCUMULATOR LENGTH:** See Chapter 15.

**WHAT COLUMN TO PRINT:** See Chapter 15.

## 21. "Look Ahead" Titles

Purpose: "Look Ahead" titles enhance the readability and informative value of your reports. A look ahead title is simply a line of information that describes the data that follows it.

Background: A look ahead title is not mysterious or difficult. You use them all the time when preparing reports by hand; when your report is on sales by region you say to yourself, "First I'll present sales for Region 1. I'd better label the information before presenting it." So you write "SALES FOR REGION 1:", then proceed to list sales by product or salesperson. You repeat the process for Region 2, and so on. Easy enough for you, but the computer does not have your ability to "look ahead" at what is about to be presented. On the other hand, it is easy for the computer tell you what it just did: "TOTAL SALES FOR REGION 1 WERE: \$5,000"; this is what "level breaks" and "accumulators" are about (see Chapter 20).

To print look ahead titles on a report, Analyst must know when to print them and what they should say. The title itself may consist of LITERAL data, plus data taken from an ALPHA, NUMERIC, INTERGER, or DATE data item. Only one lookahead title is allowed per report. The title is printed whenever a level break occurs on the specified data item. That is, to print the title "SALES FOR Region 1:", "SALES FOR Region 2:", etc., would require a level break be defined on the region data item (see Chapter 20), and that you answer the request for LEVEL BREAK NUMBER FOR LOOKAHEAD HEADING with the level break number. If you've requested subtotals by region on your report, the level break should already have been defined; all you need to know is what number it is. You can get that information from the report specifications printout. Example 21.1 shows a typical report with lookahead titles:

```

-----
SALES FOR Region 1:
  Region 1  Allen, A.      Product A      100
  Region 1  Allen, A.      Product B       40
  Region 1  Allen, A.      Product C     125
TOTAL NUMBER SOLD BY:  Allen, A. = 265
  Region 1  Brown, B.     Product A       75
  Region 1  Brown, B.     Product B     200
  Region 1  Brown, B.     Product C     160
TOTAL NUMBER SOLD BY:  Brown, B. = 435
TOTAL NUMBER SOLD FOR: Region 1 = 700

SALES FOR Region 2:
  Region 2  Allen, A.      Product A       50
  Region 2  Allen, A.      Product B       30
  Region 2  Allen, A.      Product C     110
TOTAL NUMBER SOLD BY:  Allen, A. = 190
  Region 2  Brown, B.     Product A     100
  Region 2  Brown, B.     Product B     250
  Region 2  Brown, B.     Product C       50
TOTAL NUMBER SOLD BY:  Brown, B. = 400
TOTAL NUMBER SOLD FOR: Region 2 = 590

TOTAL NUMBER SOLD FOR ALL REGIONS:      1,280
-----

```

(Example 21.1)

## HOW TO PRINT LOOK AHEAD HEADINGS

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When the Report Definition Menu appears, select #3, Detail Line Print Items, Horiz. Accums, and Headings.
3. When asked for the NUMBER OF LOOKAHEAD ITEMS, enter the number of print elements you want the look ahead title to contain. For example, "SALES FOR Region 1:" requires three "lookahead items": two LITERAL items ("SALES FOR" and ":"), and one ALPHA data item.
4. Additional requests follow which are not relevant to look ahead headings. Answer them as instructed, or press RETURN if they have already been answered.
5. At the LEVEL BREAK NUMBER FOR LOOKAHEAD HEADING request, state which level break is to control printing of the look ahead heading. Analyst assumes that a level break on the appropriate data item has been, or will be defined.
6. Define each look ahead print item requested. State its type (LITERAL,

## Chapter 21: "Look Ahead" Titles

ALPHA, NUMERIC, INTEGER, DATE) and column position to print. If the item is literal, enter the literal value. If a data item, state which one.

7. When you finish answering the requests that pertain to look ahead headings, press ESCAPE to end this section of the program, or RETURN to review your answers. Continue with the remaining sections of the program to define detail line print elements or horizontal accumulators, if you have not done so already. Otherwise, end the Detail Line Print Items, Horiz. Accums, and Headings program by pressing ESCAPE followed by RETURN until the Report Definition Menu appears.
8. It is a good idea to print the report specifications (selection #6) for reference. You can also test the correctness of your responses by printing the report. If you receive unexpected results, you can change the incorrect answers.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND  
CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.  
Enter 3 to define your look ahead heading. ESCAPE returns you to the main Analyst menu. RETURN refreshes the screen (rarely needed).

NUMBER OF LOOKAHEAD ITEMS: Enter the number of print elements contained in the look ahead heading. This includes the number of LITERAL elements, plus any ALPHA, NUMERIC, INTEGER, or DATE values you may want to print. The maximum number of items is equal to the maximum number of data items, which is 50 (unless the ANPR1.101 file is modified, see Chapter 30). This is not a request for the number of different look ahead headings, since only one lookahead heading is allowed per report. The number of times it is printed depends on how often the value changes in the data item monitored by the associated level break.

NUMBER OF DETAIL LINES PER DATA RECORD: Press RETURN or see Chapter 22. Not relevant to lookahead headings.

DETAIL LINE NUMBER: n  
NUMBER OF PRINT ELEMENTS FOR THIS DETAIL LINE: Press RETURN or see Chapter 12. Not relevant to lookahead headings.

NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS (0-9): Press RETURN or see Chapter 12. Not relevant to lookahead headings.

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: Press RETURN or see Chapter 23.  
Not relevant to lookahead headings.

LEVEL BREAK NUMBER FOR LOOKAHEAD HEADING: Enter the number of the level

break that controls when the heading should print. Check the report specifications printout if you are not sure. For example, if you want the heading to print when the region changes, enter the number of the level break that monitors the region data item for a change in value (see Chapter 20 for an explanation of "level breaks"). This assumes you have or will define such a level break (the "total line" for the level break need not contain any accumulators if the sole purpose is to trigger printing of the lookahead heading).

LOOKAHEAD PRINT ELEMENT NUMBER: n

LOOKAHEAD ITEM TYPE (3=LIT;4=NUM;5=INT;6=ALPHA;7=DATE): Asked for each look ahead print item. Enter the type of item, starting with the leftmost item in the heading.

ENTER LITERAL DATA: Asked if the type of heading is LITERAL. Type the literal value you want to print, for example, "SALES DATA FOR WEEK OF:".

DATA FILE ITEM NAME/NUMBER: If the type of heading is ALPHA, NUMERIC, INTEGER, or DATE enter the name or number of the data item. For example, to print the lookahead heading "SALES DATA FOR WEEK OF [date]", state which data item on the file stores the date. The date (or other data file information) printed is that in the last record read before the level break occurred (it is not a total). Review chapters 15 and 20 if you do not understand level break processing.

PRINT IN COLUMN NUMBER: Enter the number of the column where the lookahead item should begin printing. Overlapping items are forced to the next line.

HIT ESCAPE TO EXIT THIS SECTION,

OR RETURN TO MAKE MORE CHANGES: There are no more requests in this program that pertain to lookahead headings. You can review or correct your answers by pressing RETURN, or press ESCAPE followed by RETURN until the menu appears.

## 22. Printing More Than One Line Per Record

Purpose: While a data record may contain up to 255 characters of information (see Chapter 6), most printers are only able to print 132 characters per line (even less for some). In order to show more information than will fit on a single line, plus allow for spacing between print elements, there must be a way to continue printing on the next line. This requires the ability to define more than one "detail line" per data record, which Analyst provides. Chapter 12 explained the concept of a detail line. This chapter explains the use of "multiple detail lines".

Background: Instructing Analyst to print additional detail lines is easy. When you define the report format, state the number desired and define the print elements for each in the normal way. The maximum number is 5, unless you modify the ANPR1.101 file; see Chapter 30.

This feature gives you more control over the vertical placement of information on the report (down the page). Horizontal placement (across the page) is controlled by the starting print column you set for the individual detail line print elements.

Multiple detail lines also facilitate the printing of mailing labels. There is no right or wrong way to print labels or forms; there may be several ways to accomplish the same end. If your labels are one inch apart (like most standard labels), and you want to print five lines on each, here's what you can do:

1. Request five detail lines per data record.
2. Define them as follows:
  - LINE #1: Name, expiration date or other code
  - LINE #2: Address line #1
  - LINE #3: Address line #2
  - LINE #4: City, State, Zipcode or other postal code
  - LINE #5: Country, or reference information.
3. Set the number of lines to skip between data records to a value of one. (Set to two if only four lines are printed per record.)
4. If you can set the physical page length on your printer equal to the distance between labels, use this method:
  - a. Set physical form length on printer to 1" or 6 lines (if printing 6 lines per inch).
  - b. Request the option to perform level break processing on every record through Report Definition Menu selection #4 (see Chapter 20). Print zero totals. Request the option to skip to next "page" (i.e., label) after "printing" totals.
  - c. This method is best when the number of records is very large (over several thousand).
5. If you cannot set the physical page length on your printer equal to the distance between labels, use this method:
  - a. Leave the form length setting on your printer at the current value.
  - b. Set the number of lines to print per page at a very high value through Report Definition Menu selection #1, Standard Parameters. If the number of labels to be printed is 1,000 and each label takes up 6 lines (including the number of lines to skip between data records), the number of lines to print per

## Chapter 22: Printing More Than One Line Per Record

- page must be set over 6,000. The maximum setting is 32,000.
- c. This method fools Analyst into thinking that all the labels are printed on a single "page". The other method does just the opposite, since each label is printed on a separate "page".
6. In either case, the number of report titles should be set to zero.

### HOW TO PRINT MORE THAN ONE LINE PER RECORD

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When the Report Definition Menu appears, select #3, Detail Line Print Items, Horiz. Accums, and Headings.
3. Enter the number of detail lines desired per record.
4. Enter the number of print elements for each detail line, then define each element as explained in Chapter 12.

### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu. Enter 3 to request multiple detail lines. ESCAPE returns you to the main Analyst menu. RETURN refreshes the screen (rarely needed).

NUMBER OF LOOKAHEAD HEADINGS: Press RETURN or see Chapter 20. Not relevant to multiple detail lines.

NUMBER OF DETAIL LINES PER DATA RECORD: How many lines are needed to display the information printed for each data record? If you want to show 150 characters of data on an 8 1/2" x 11" report, at least two detail lines will be required. Don't forget to allow for spacing between detail line print elements. Enter the desired number, up to a maximum of 5.

DETAIL LINE NUMBER: n

NUMBER OF PRINT ELEMENTS FOR THIS DETAIL LINE: Asked for each detail line. Enter the number of print elements desired (including "horizontal accumulators"; see Chapter 23). Chapter 12 explains how to count the number of print elements.

NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS: Press RETURN or enter the number of lines to skip. This request controls spacing between data

Chapter 22: Printing More Than One Line Per Record

records, not between detail lines.

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: Press RETURN or see Chapter 23.  
Not relevant to multiple detail lines.

HIT ESCAPE TO EXIT THIS SECTION,  
OR RETURN TO MAKE MORE CHANGES: There are no more requests in this program  
that pertain to the number of detail lines to print per data record.  
You can review or correct your answers by pressing RETURN, or press  
ESCAPE followed by RETURN until the menu appears.

DETAIL LINE NUMBER: n  
PRINT ELEMENT NUMBER: n  
ELEMENT TYPE: Analyst asks for a description of each print element on each  
detail line. Chapter 12 explains how to answer the requests for TYPE,  
and PRINT COLUMN NUMBER.

## 23. Math Across Columns

Purpose: In addition to printing information entered into the data file at the keyboard, Analyst can generate new information by performing math on the stored data. You can add, subtract, multiply, or divide two or more data items, and print the result on the detail line (e.g., multiply "number sold" times "unit price" and print result as "total amount of sale".) You can also calculate percentages. The effect is performing "math across columns", but in fact the inputs to the math functions can include more than just items from a data record.

Analyst performs math on the results of other mathematical calculations ("horizontal" accumulators, such as those created by multiplying two data items together), on subtotals calculated when a level break occurs ("level break" accumulators, Chapter 20), on grand totals for a report ("summary" accumulators, Chapter 25), on the results of mathematical calculations performed on total line accumulators ("cross-foot" accumulators, Chapter 24), and even on a constant value you supply.

Such facilities allow for very complex reports. We suggest you start by performing simple math functions on your reports (e.g., number sold x retail price = gross sale). Get comfortable with the concept of "horizontal accumulators", and with the way the entry programs operate. Then advance to more complex report calculations if you wish.

Background: By defining one or more horizontal accumulators you can compute the result of a mathematical function performed on up to 5 "inputs", plus a constant value (a "constant" is an input that doesn't change from computation to computation). You can print the result as a detail line print element, or suppress printing and use it as input to another horizontal accumulator. Or, through "extraction" (Chapter 27), you can create a new data item that contains the value in the horizontal accumulator. You can even add up columns of horizontal accumulators, printing them as totals or subtotals, since a horizontal accumulator is calculated every time a record is printed.

The maximum number of horizontal accumulators you can define for a report is five (unless the ANPR1.101 file is modified, see Chapter 30). You may not want to print all five on the report. Some may simply store an interim result, used as input to a higher numbered accumulator, or to generate a subtotal.

The same math function is performed on all inputs to a horizontal accumulator. That is, you cannot define horizontal accumulator #1 as (data item #1 x data item #2 - data item #3). Instead you would define horizontal accum #1 as (data item #1 x data item #2), then define a second horizontal accum (#2) as (horizontal accum #1 - data item #3). See Example 23.3.

The order in which you define horizontal accumulators is important. You cannot use a higher number horizontal accum as input to a lower number horizontal accum. That is, (horiz. accum #1 - horiz. accum #4 = horiz. #3) is not allowed.

If the math function performed by the horizontal accum is percent (%), only two inputs should be entered. The program divides input #1 by input #2

Chapter 23: Math Across Columns

and multiplies the result by 100 to arrive at the percent of #2.

USING HORIZONTAL ACCUMULATORS

Horizontal accumulators can be used to compute extensions, averages, percentages, variances, and other common business equations. The following examples show how they might be used to generate a simple sales report. In the three examples the inputs are either data items or other horizontal accumulators. To calculate the percentage of total sales to attribute to each salesperson would require "cross-foot" and "summary" accumulators (see chapters 24 and 25). To calculate the percentage of a salesperson's total to attribute to each product would require "level break" total line accumulators as input (see Chapter 20). Example 2.1 shows the use of summary accums, level break accums, and cross foot accumulators.

EXAMPLE 23.1

PROBLEM DEFINITION: Your data file consists of 6 data items:

ITEM NO.	DESCRIPTION	ITEM TYPE	LENGTH	RIGHT DIGITS
1	Date	DATE	6	
2	Name of Salesperson	ALPHA	20	
3	Product Sold	ALPHA	1	
4	Number of Units Sold	INTEGER	4	
5	Retail Price Per Unit	NUMERIC	9	2
6	Tax Rate	NUMERIC	6	4

Name, product sold, and number of units sold have been defined as detail line print elements. Assume the retail price includes an allowance for tax. Assume also that a tax rate of 6.5% is entered as "0.065", not "6.5". Create a report that multiplies the number of units sold times the retail price per unit, and displays the result as the gross sale amount.

SOLUTION: The report requires one horizontal accumulator with two inputs (data items 4 and 5). The "horizontal accumulator function" is multiplication. The result is stored in horizontal accumulator #1 and printed on the detail line to the right of existing print elements.

EXAMPLE 23.2

PROBLEM DEFINITION: Show how much of the gross sale is tax, using the tax rate stored on the data record.

SOLUTION: The report requires two horizontal accumulators. Horizontal accumulator #1 is the same. Horizontal accumulator #2 is the product of two inputs: input #1 is horizontal accumulator #1 (gross sale), input #2 is data item #6 (tax rate). Horizontal accumulator #2 should print to the right of horizontal accumulator #1 on the detail line.

EXAMPLE 23.3

PROBLEM DEFINITION: Show the net sale amount on the report. Don't display the amount of tax.

SOLUTION: The report requires three horizontal accumulators. This is true even though only two of them are actually printed on the report. The first two are the same as in the previous example. The third is the result of subtracting horizontal accumulator #2 from horizontal accumulator #1 (the two inputs are horizontal accumulators). Horizontal accumulator #2 will not print on the report unless defined as a detail line print element; therefore do not include it in your count of the number of detail line print elements.

## HOW TO DEFINE HORIZONTAL ACCUMULATORS

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When the Report Definition Menu appears, select #3, Detail Line Print Items, Horiz. Accums, and Headings.
3. Enter the total number of horizontal accumulators needed for the report. Include those you want to print on the detail line, plus any non-printing horizontal accumulators.
4. Define the horizontal accumulators you want to print as detail line print elements (type #8). State which horizontal accum to print (they are numbered 1 through n for the report as a whole). State the length of the horizontal accum (3-14), and the column to print it on the report. Repeat for each horizontal accum to be shown on the report.
5. Define each horizontal accum you requested. This entails defining the function, type of accum, and type of inputs:
  - a. Define math function:
    - 1). Add the inputs together: may add up to 5 inputs plus a constant. The order in which the inputs are defined is not important.
    - 2). Subtract input n+1 from input n: may subtract up to 4 amounts (plus a constant) from the "minuend" (the minuend is the number subtracted from). To subtract 15 and 20 from 100, enter 100 as the first input (n, or the minuend), then 15 and 20 as the next inputs (in any order). The result is  $(100-15)-20=65$ .
    - 3). Multiply the inputs: may multiply up to 5 inputs plus a constant. The order in which the inputs are defined is not important.
    - 4). Divide input n by input n+1: the first input is the "dividend" (the number being divided), the next inputs (including the constant) are the "divisors". To perform the equation  $(100/20)/5$ , enter 100 as input #1; the order in which you enter

## Chapter 23: Math Across Columns

- the remaining inputs is not important.
- 5). Calculate percentage: Finds out what percent input #1 is of input #2 by dividing 1 by 2 and multiplying the result by 100. No more than two inputs should be entered. To find what percent of total sales can be attributed to Product A, define input #1 as Product A sales and input #2 as Total Sales.
- b. Define accum type:
- 1). Numeric: Inputs to a numeric accumulator can be numeric or integer. If the accum is numeric, the program asks for the number of digits to the right of the decimal. If an input is more precise than the accumulator, the excess digits are truncated.
  - 2). Integer: Inputs can be either numeric or integer, but if numeric the excess digits are truncated, not rounded.
- c. Define input type:
- 1). Horizontal accumulator: Input to a horizontal accum can be another horizontal accum. Note that you cannot define a higher number accumulator as input to a lower number accumulator. That is, horizontal accum #4 cannot be used as an input to horizontal accum #3.
  - 2). Summary accumulator: A "summary" accumulator is a report grand total created by the Extract program (and stored as a "header" record on the data file). Used most frequently when calculating percents of report totals. See Chapter 25.
  - 3). Level Break total line accumulator: Input to a horizontal accumulator can be a total line accumulator calculated when a level break occurs (except those calculated on an End of File level break; use summary accumulators instead). Level break accumulators are numbered from 1 to n for the report as a whole (although they may print on different total lines). Used most frequently when calculating percents of subtotals. See Chapters 15 and 20.
  - 4). Cross-Foot accumulator: A "cross-foot" accumulator is similar to a horizontal accumulator, but is a result of math performed on total line accumulators (e.g., total gross sales - total tax = total net sales for region). Cross-foot accumulators can be used as input to a horizontal accumulator. They are numbered 1 to n for the report. See Chapter 24.
  - 5). Data Item: Input to a horizontal accum can be a numeric or integer data item. This is the simplest, and perhaps most frequent, type of input to a horizontal accum.
  - 6). Constant: Input can be a constant value, either integer or numeric, positive or negative.
6. After defining the horizontal accumulators, return to the Report Definition Menu and print the report specifications (selection #6). Check your answers carefully and print a test report if you can. As a further check, you may want to compute the results by hand and compare them with the computer's results. You can edit the Report Definition File if changes are necessary.

MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.

Enter #3 to define horizontal accumulators. Enter ESCAPE to return to the main menu, or RETURN to refresh a garbled screen (rarely needed).

NUMBER OF LOOKAHEAD ITEMS: Press RETURN or see Chapter 21. Not relevant to horizontal accumulators.

NUMBER OF DETAIL LINES PER DATA RECORD: Press RETURN or see Chapter 22. Not relevant to horizontal accumulators.

DETAIL LINE NUMBER: n

NUMBER OF PRINT ELEMENTS PER DETAIL LINE: To print a horizontal accum it must be defined as a detail line print element. They may be printed anywhere on the detail line, and on any detail line if more than one has been specified.

If you have already defined the detail line you can add more elements to it by entering the new number of print elements at this request. For example, let's say you've already defined a detail line consisting of 6 print elements, and now want to compute the sum of data item #1 and #4 and show the result on the report. You have two options: 1) change the number of print elements to 7, and define horizontal accum #1 as print element #7; column to begin printing must be to the right of the other elements, or 2) change the number of print elements to 7, and redefine them so you can print the horizontal accum wherever you desire on the detail line.

NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS (0-9): Press RETURN or see Chapter 12. Not relevant to horizontal accumulators.

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: Enter the total number of horizontal accumulators for the report as a whole. The maximum is 5 (unless the ANPR1.101 file is modified; see Chapter 30). Include printing and non-printing horizontal accumulators.

LEVEL BREAK FOR LOOKAHEAD HEADING: Press RETURN at this and other requests that pertain to look ahead headings, or see Chapter 21. Or, you may press ESCAPE at this request to advance to the next section of the program.

DETAIL LINE NUMBER: n

PRINT ELEMENT NUMBER: n

Press RETURN at this and other requests that pertain to detail line print elements, or see Chapter 12, unless you need to define a horizontal accum as a detail line print element. You may press ESCAPE to advance to the next section of the program if you've already defined the print elements.

## Chapter 23: Math Across Columns

HORIZONTAL ACCUMULATOR NUMBER: n

HORIZONTAL ACCUMULATOR FUNCTION (+ - \* / %): This and the several requests which follow are asked for each horizontal accumulator you requested. If the report contains more than one horizontal accumulator, the order in which they are defined may be important. Specifically, a higher number horizontal accum cannot be used as input to a lower numbered accumulator. Enter the function to be performed on the inputs to the horizontal accum by typing the appropriate symbol (plus, minus, asterisk, slash, percent) or a number 1-5, respectively.

HORIZONTAL ACCUMULATOR TYPE (1=NUM, 2=INT): Do you want to express the result of the mathematical function as an integer or numeric value? If one or more input has digits to the right of the decimal, you should specify numeric. If an input has more digits to the right of the decimal than the number specified for the accumulator, the excess is truncated. This is also true if the accumulator type is integer but one or more of the inputs are numeric.

NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT: Asked when the accumulator type is numeric.

INPUT NUMBER: n

TYPE OF INPUT:

TYPE AND NUMBER OF INPUT (H#=HOR, S#=SUM, B#=BRK, X#=XFT, I#=ITM, 0=NONE): The types of inputs are described in Step 5 of HOW TO DEFINE HORIZONTAL ACCUMULATORS. To specify the type and number of an input, enter the desired letter, followed immediately by the number. For example, enter "i5" for data item #5, "h2" for horizontal accumulator #2, "b6" for level break accumulator #6, etc. The Report Specifications printout will help you determine the correct number. If the level break, cross-foot, or summary accumulators have not yet been defined, the program tells you they do not exist and asks you to confirm that you will create them later.

Typing zero (0) signals that you are done entering inputs.

VALUE FOR CONSTANT: Asked after the five requests for inputs have been answered. The constant is also an input. It may be a positive or negative numeric or integer value.

## 24. Math On the Total Line

Purpose: In the same way that horizontal accumulators perform math on the detail line, "cross-foot" accumulators perform math on the total line. This facility allows you to print the results of mathematical computations on the same line as totals and subtotals. A typical application would be the calculation of commissions due to salespeople (total up sales for products sold, multiply total by commission rate, and print result).

Background: Recall that the "total line" is the line which prints when a level break occurs (see chapters 15 and 20). A "level break" is a change in the value of a data item that triggers the totalling process. The totals that print on the total line are called "level break accumulators", and are specified during report definition. Level break accumulators total up data items and horizontal accumulators, and can also be used to print a count of records read and records printed.

The simplest and most common use of cross-foot accumulators is to perform math on level break accumulators. For example, you might print the total sales for each salesperson, total the number of hours worked (if the data is stored on the file), and divide the first amount by the second amount to arrive at sales per hour. Level break processing should be ordered to occur on a change in the salesperson's name. Total sales (printed) and hours worked (not printed) would be level break accumulators, and sales per hour would be a cross-foot accumulator. Literals are also defined to improve the report's informative value.

8/26/81	Abel, Alan	402.75	8
8/27/81	Abel, Alan	333.27	8
8/28/81	Abel, Alan	600.25	7
8/29/81	Abel, Alan	225.14	4
WEEK'S SALES WERE 1,561.41 SALES/HR.= 57.83			

8/26/81	Brown, Barbara	400.50	8
8/27/81	Brown, Barbara	655.12	8
8/28/81	Brown, Barbara	201.10	4
8/29/81	Brown, Barbara	723.18	9
8/30/81	Brown, Barbara	150.00	3
WEEK'S SALES WERE 2,129.90 SALES/HR.= 66.55			

Inputs to cross-foot accumulators can include level break accumulators, other cross-foot accumulators, summary accumulators (Chapter 25), and the sum of horizontal accumulators (horizontal accums can also be summed by level break accumulators). Cross-foot accumulators work very much like horizontal accums. The math functions are performed on the inputs in the same way, and cross-foot accums are defined in like manner.

Up to 10 cross-foot accumulators may be defined for a report (more if you modify the ANPR1.101 file, see Chapter 30). They are numbered from 1 to n for the report as a whole (even if they print on totals lines for different level breaks).

When you define a cross-foot accumulator the program asks for the column to begin printing it. Unlike horizontal accums, which must be included in the count of detail line print elements to be printed, cross-foot accums should not be included in your count when you answer the HOW MANY TOTALS TO PRINT? request.

HOW TO DEFINE CROSS-FOOT ACCUMULATORS

1. Select #3, Define a Report, from the menu. If you haven't defined or printed a report in the current session, Analyst asks you to ENTER NAME OF REPORT DEFINITION FILE. Otherwise it assumes you want to edit the Report Definition File last used. If the assumption is wrong, return to the main Analyst menu by pressing ESCAPE, then select #11, New Definition Files. When you select #3 again, Analyst will ask for the name of the Report Definition File to create or edit.
2. When the Report Definition Menu appears, select #4, Level Breaks, Cross-Footing, and Accums.. If you have not already defined level break subtotalling for your report, you should do so now (see chapters 15 and 20). Cross-foot accumulators are ordered for each level break and print on the total line controlled by the level break.
3. When asked HOW MANY TOTALS TO PRINT for the level break, do not include the number of cross-foot accumulators in your count.
4. Specify the number of cross-foot accumulators for the level break when asked HOW MANY CROSS-FOOT ACCUMULATORS. Include both printing and non-printing cross-foot accums.
5. After you define the level break accumulators the program asks you to define each of the cross-foot accums you requested. Specify the function (+ - \* / %), type (NUMERIC or INTEGER), length (3-14), number of digits to the right of the decimal, and up to 5 inputs, plus a constant (see Chapter 23).

In addition to a constant, there are four kinds of inputs:

Horizontal Accumulator: A total of the values calculated by a horizontal accumulator may be used as input to a cross-foot accumulator. The same thing can be accomplished by totaling a horizontal accumulator with a level break accumulator, and then using the level break accumulator as input.

Summary Accumulator: A "summary" accumulator is a report grand total created by the Extract program (and stored as a "header" record on the data file). If you need a report grand total for input to a cross-foot accum, do not use a level break accumulator that is calculated on an end of file (EOF) level break. Use a summary accumulator instead.

Level Break Accumulator: Level break accumulators may be used as input to a cross-foot accum. Although it less common, the level break accum may be from any level break total line, not necessarily from the same total line as the cross-foot accumulator.

Cross-Foot Accumulator: Another cross-foot accumulator may be used as input. The only restriction is that it have a lower number than that being defined. That is, cross-foot accum #3 may not be used as input to cross-foot accum #2.

6. State the column to print the cross-foot accumulator. You can locate it

anywhere on the total line where there is room; it need not print to the right of the other total line accumulators. To suppress printing of a cross-foot accum (for example, if it holds an interim value to be input to another cross-foot accum), type zero (0) at the WHAT COLUMN TO PRINT CROSS-FOOT ACCUM request.

#### MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF REPORT DEFINITION FILE: See Chapter 12.

REPORT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 12.

NAME OF FILE DEFINITION FILE: See Chapter 12.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Report Definition Menu.

Enter #4 to define cross-foot accumulators. Enter ESCAPE to return to the main menu, or RETURN to refresh a garbled screen (rarely needed).

ENTER NUMBER OF LEVEL BREAKS: Since cross-foot accums are calculated and printed when a level break occurs, at least one level break must be defined for the report in order to use cross-foot accums. Press RETURN or see chapters 15 and 20.

LEVEL BREAK NUMBER: n

BREAK ON DATA FILE ITEM NAME/NUMBER (-1=ALL RECS, 0=END OF FILE): Each level break monitors a data item for a change in value. When a change is detected (new salesperson, date, or product for example), level break totalling (including cross-foot calculation) occurs. If multiple level breaks are used (see Chapter 20), make sure you define your cross-foot accumulators for the right level break.

HOW MANY TOTALS TO PRINT: Press RETURN or see chapters 15 and 20. This is a request for the number of level break accumulators to print on the total line. Do not include cross-foot accumulators in your count, but do include any literal values you may want to label the results of the cross-foot calculations.

HOW MANY CROSS-FOOT ACCUMULATORS: Enter the number of cross-foot accumulators for this level break total line. Include both printing and non-printing cross-foot accums in your count. The maximum number for a report is 10 (unless you modify the ANPR1.101 file, see Chapter 30).

HOW MANY LINES TO SKIP BEFORE TOTALS (0-9, -1 NEW PAGE): Press RETURN or see Chapter 15. Not relevant to cross-foot accumulators.

HOW MANY LINES TO SKIP AFTER TOTALS (0-9, -1 NEW PAGE): Press RETURN or see Chapter 15. Not relevant to cross-foot accumulators.

ACCUMULATOR NUMBER: n. n OF n THIS BREAK.

ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;5=INT;6=ALPHA;7=DATE;8=HOR. ACCUM):

This and the several requests following which pertain to level break accumulators are covered in chapters 15 and 20. Press RETURN to retain the current responses, or see chapters 15 and 20 for instructions.

## Chapter 24: Math On the Total Line

CROSS-FOOT ACCUMULATOR NUMBER: n n OF n THIS BREAK.

CROSS-FOOT ACCUMULATOR FUNCTION (+ - \* / %): Define the function to be performed on the inputs to the cross-foot accum. Math is performed on inputs to cross-foot accums similarly to horizontal accums. See Chapter 23. Type the actual symbol (plus, minus, asterisk, slash, percent), or the appropriate number 1 through 5.

CROSS-FOOT ACCUMULATOR TYPE (1=NUM, 2=INT): The result of the mathematical function can be expressed as a numeric or integer value. See the corresponding request in Chapter 23.

ACCUMULATOR LENGTH: Enter the desired length of the accumulator. The maximum is 14 digits. Include the decimal point and minus sign in your count, if used.

NUMBER OF DIGITS TO THE RIGHT OF DECIMAL POINT: Asked when the accumulator type is numeric.

INPUT NUMBER: n

TYPE OF INPUT ACCUMULATOR:

NUMBER OF INPUT ACCUMULATOR (H#=HOR;S#=SUM;B#=BRK;X#=XFT;0=NONE): Enter the type and number of each input. The four possibilities are horizontal accum (HOR), summary accum (SUM), level break accum (BRK), and cross-foot accum (XFT). Enter the letter that corresponds to the type of accumulator, followed immediately by the number of the accumulator. For example, enter "h2" for horizontal accum #2, "b4" for level break accum #4, "s1" for summary accum #1, etc. If the level break, cross-foot, horizontal, or summary accumulators have not yet been defined, the program will ask you to confirm that you will create them later. Type zero (0) to end the requests for input, or press RETURN until you get to the VALUE FOR CROSS-FOOT CONSTANT request.

VALUE FOR CROSS-FOOT CONSTANT: If you desire a constant as one of the input values, enter it at this request. The constant can be a positive or negative number, either integer or numeric.

WHAT COLUMN TO PRINT CROSS-FOOT ACCUM: Enter the column on the report to begin printing the cross-foot accumulator, or zero (0) to suppress printing. Although the program asks you where to print regular level break accumulators first, cross-foot accumulators can be printed anywhere on the total line. Check the layout of the report format on your spacing chart for the exact column number. Don't forget to allow for commas or a minus sign.

## 25. Extracting to Create "Summary Accumulators"

Purpose: The purpose of "summary accumulators" is to compute grand totals of numeric or integer data items for use as inputs to horizontal or cross-foot accumulators in a report. This facility enables Analyst to prepare reports that show percents of grand totals, or results of other calculations that require grand totals. Refer to chapters 23 and 24 for a treatment of horizontal and cross-foot accumulators.

Background: Before printing a report that uses one or more summary accumulators (the Report Specifications printout states if they are needed), you must perform an "extract" operation to create or update them. The Extract program reads an "input" data file, writes out a new "output" data file, then totals up one or more data items on the output file, storing the results on "header" records on the output file. (A "header" record is a special kind of record stored at the top of the data file. It is not important to understand the concept, since Analyst manages all operations that pertain to header records automatically.)

The input data file and the output data file may have the same or different record structures. One of the functions of the Extract program is to change the data file record structure (see Chapter 27). Summary accumulators total up data items on the output data file. Thus, if the output file has the same record structure as the input file, the effect is to give you a total of one or more data items on the input file.

The input data file and the output data file cannot have the same name. This is because Extract cannot read from and write to files with the same name. For this reason reports using summary accumulators should be set up to read the output data file, while data entry and sorting should be performed on the input data file. Thus, when you run #2, Create or Modify a Data File, you should give the name of the File Definition File (FIL file) that defines the input data file. When you define a report with summary accumulators, and are asked for the name of the FIL file to use, you should name the FIL file that describes what is, or will be, the output data file.

Before Analyst can process the input data file to create the output data file, the File Definition File that defines the output data file must exist. The FIL file that defines the input data file should contain the name and drive location of the input data file. The FIL file that defines the output data (created or updated by the Extract program) should contain the name and drive location of the output data file. When the sole purpose of the extract is to create or update summary accumulators, both FIL files will be exactly alike in all other respects.

There are two ways to create the FIL file that defines the output data file. First, you can define it using the Define a Data File program. Make the same responses to the requests, except when asked for the name of the data file defined. Enter instead the name of the output data file that will be created by the extraction process. If the output data file will fit on the same disk as the input data file (see Chapter 32), give the same drive location, otherwise enter a different one (the Print a Report program will expect the data file on the drive you specify).

The second method is a "shortcut" that uses CP/M's PIP command. First you create a duplicate of the input FIL file (with a different name, of course), then run Define A Data File to change the name (and drive

## Chapter 25: Extracting To Create "Summary Accumulators"

location, if necessary) of the data file it describes. The command:

```
PIP OUTPUT.FIL=INPUT.FIL
```

creates a file named OUTPUT.FIL which is exactly the same as INPUT.FIL. Call up Analyst, then edit OUTPUT.FIL.

In order to extract, there must be room for the output data file, if not on the disk that holds the input data file, then on another disk (see Chapter 32, Calculating Disk Storage Space). This means that the largest file that may be extracted on a two drive system (assuming drive A is filled with programs) is 1/2 disk, if no other large files are on the disk. Computer systems with more than two disk drives can extract a full disk of data.

Disk switching is not allowed during extraction as it is for sorting. You can, however, create an "Extract Work Disk" similar to the "QSORT Work Disk" described in Chapter 14. It should reside in the currently logged drive (usually A) and contain the programs AN.COM, AN.SSG, and ANEXTRAK.SSG, as well as the ANPR1.101 file. This leaves room for a larger output file. You would call up the Analyst menu in the normal way, but only selection #6, Extract would operate. Make sure the definition and data files are in the drives where they are expected before attempting the extraction. The output file should be assigned to A for the purpose of extraction, but may need to be changed when you want to print the report. If the output data file is created on a different disk than the input data file, make sure it resides in the drive where the Print a Report program expects it.

Once an extraction has been defined, it can be repeated over and over. Make sure the input data file resides on the drive named in the FIL file that describes it, and that there is a disk with sufficient space in the drive where the output data file is expected to reside. The FIL (file definition), EXT (extract definition), RPT (report definition), and SRT (sort parameter definition) files are always expected to reside on the DEFINITION FILE DRIVE (see Chapter 5).

### USING SUMMARY ACCUMULATORS

#### EXAMPLE 25.1

PROBLEM DEFINITION: Your datafile consists of 2 data items:

ITEM NO.	DESCRIPTION	ITEM TYPE	LENGTH
1	Name of Salesperson	ALPHA	25
2	Number of Units Sold	INTEGER	3

and you want a report that looks like this:

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UNIVERSAL PRACTICE COMPANY SAMPLE REPORT USING SUMMARY ACCUMULATORS		
SALESPERSON	NO. SOLD	% OF TOTAL
Abel, Alan	10	33.3
Brown, Barbara	5	16.6
Crane, Carol	15	50.0
TOTAL SOLD = 30		100.0

The data file is named SALES.DAT and is defined by a FIL file named SALES.FIL. It is on drive B, and is less than 1/2 disk in size. Assume there is one record on the file for each salesperson. The definition files are also on B.

SOLUTION: First, define a report named PERCENT.RPT that prints the percentage contributed by each salesperson to the total number of units sold. The report requires one horizontal accumulator printed on the detail line to the right of the NO. SOLD data item. The math function is percent (%). Input #1 is data item #2. Input #2 is summary accumulator #1. To print the total line at the end of the file requires a level break on the end of file (EOF), with 3 accumulators. Accum #1 is a literal (TOTAL SOLD =), accum #2 totals data item #2, and accum #3 totals horizontal accumulator #1.

Because the report uses a summary accumulator, extraction is required. Level break accum #2 cannot be used as input to the horizontal accumulator since accumulators calculated on an EOF level break cannot be used as input to a horizontal or cross-foot accumulator. Before you run Define An Extraction, create a file that duplicates SALES.FIL, except for the name of the data file it describes (see Background section). Call it PERCENT.FIL. PERCENT.FIL should define PERCENT.DAT, which will be created by the extraction. The PERCENT.RPT report should use PERCENT.FIL, not SALES.FIL. However, when you add or change data, or define a sort, the FIL file to use should be SALES.FIL. The PERCENT.DAT data file is only used to print the PERCENT.RPT report.

To define the extract run Define an Extract to create an "Extract Definition File", which holds the instructions for the extract. Name the Extract Definition File PERCENT.EXT (the last name of EXT is assumed). There are two extract definition programs that must be run: 1) Link Input and Output Items and Horizontal Accums, and 2) Summary Accumulators. The first is easy to run since the data items on the output file are identical to those on the input data file (output data item #1 should contain the data in input data item #1, etc.). To define the summary accumulator you simply state which data item on the output file to accumulate (data item #2).

Once defined you perform the extraction by choosing the Extract program from the main menu, and entering the name of the Extract Defintion (EXT) file, in this case PERCENT. When the extract is finished, you can print the PERCENT report.

HOW TO DEFINE SUMMARY ACCUMULATORS

1. If the sole purpose of the extraction is to create summary accumulators, the input and output data files will have the same record structure. Therefore, create a duplicate of the File Definition File that defines the input data file; the duplicate should have a different filename, and should differ from the original only in the name (and perhaps drive location) of the data file it describes. The output data file need not be created (but it may well exist) before extraction, since the extraction itself will create it.
2. Select Define An Extraction from the main Analyst menu.
3. Enter the name of the Extract Definition File you want to create or edit. If the file does not exist, if you misspelled the name, or if it exists but is not on the DEFINITION FILE DRIVE (see Chapter 5), the program asks for confirmation to create it.
4. Enter the name of the input File Definition File (i.e., the name of the file that describes the input data file).
5. Enter the name of the output File Definition File (i.e., the name of the file that describes the output data file).
6. The extract definition menu shown below should appear next:

```
-----  
*****          A N A L Y S T          *****  
  
      E X T R A C T      D E F I N I T I O N      M E N U  
  
      EXTRACT DEFINITION FILE:    PERCENT.EXT  
      INPUT FILE DEFINITION FILE:  SALES.FIL  
      OUTPUT FILE DEFINITION FILE: PERCENT.FIL  
  
      1  LINK INPUT AND OUTPUT          2  SUMMARY ACCUMULATORS  
        ITEMS AND HORIZ ACCUMS  
      3  LEVEL BREAKS AND ACCUMS      4  RECORD SELECTION CRITERIA  
      5  PRINT EXTRACT FILE  
CR REFRESH MENU                      ESC STOP PROGRAM  
  
      ENTER NUMBER OF FUNCTION DESIRED  
-----
```

7. Select #1, Link Input and Output Items and Horiz Accum. This program asks you to link data items on the input file to data items on the output file. It tells you the name of the output file data item, and asks for the name (or number) of the corresponding input data item (or horizontal accum; see Chapter 27). If only purpose of the extract is to create summary accumulators, they should be exactly the same. The program also asks for the NUMBER OF HORIZONTAL accumulators. This is an

## Chapter 25: Extracting To Create "Summary Accumulators"

advanced topic covered in Chapter 27.

8. Next, select #2, Summary Accumulators. This program asks for the number of summary accumulators you want to create, and the name of the output file data item to accumulate. In the simplest case only one data item is totaled in a single summary accumulator, but it is possible to create a summary accumulator that is the product (or sum, or difference, etc.) of two or more grand totals (for example, total number on hand plus total number backordered, or total sales times a constant value equal to the sales tax rate to produce net sales). The grand totals of up to 5 data items, plus a constant may be input to a summary accumulator. The math function performed on the inputs can be +, -, \*, /, or %. If only a single data item is input, the function is + (e.g., for total number of units sold).

### HOW TO PERFORM AN EXTRACTION

1. Make sure the input data file is on the drive named in the input File Definition File, and that there is a disk in the drive named in the output File Definition File as the output data file location. Make sure that the definition files (FIL, EXT) are in the DEFINITION FILE DRIVE (Chapter 5).
2. Select #6, Extract, from the main Analyst menu.
3. Enter the name of the Extract Definition File you want to use. If you have created, edited, or used an EXT file in the current session, Analyst assumes that is the one to use. If it is not the correct file, select #11, New Definition Files, from the main menu before choosing #6. If you have already chosen #6, you can enter ESCAPE to return to the main menu.
4. WARNING--If the input and output data files have the same name (unless they are on assigned to different disk drives), and you proceed with the extract (after being asked if you want to continue), both files will be lost. If the output file already exists, it will be overwritten with the new, updated version of the output file.

### MEANING OF REQUESTS AND VALID RESPONSES

#### Define An Extraction Requests

ENTER NAME OF EXTRACT DEFINITION FILE: Enter the (up to) 8 character filename of the Extract Definition File you want to create or edit. This is the name you should give to perform the extraction later. The last EXT file created, edited, or used in the current run is assumed and this request suppressed, unless you run #11, New Definition Files before selecting Define An Extraction.

#### EXTRACT FILE NOT FOUND

CREATE ONE? (Y OR N): The request is normal if the Extract Definition File is new. A may also be asked if you misspelled the name, inserted the wrong disk, or if the file is not on the DEFINITION FILE DRIVE (see Chapter 5).

## Chapter 25: Extracting To Create "Summary Accumulators"

NAME OF INPUT FILE DEFINITION FILE: Enter the (up to) 8 character filename of the FIL file that defines the input data file (the file to be extracted from).

INPUT FILE DEFINITION FILE NOT FOUND

CONTINUE? (Y OR N): The input and output FIL files must exist before you can define an extraction (see Background section above). You may have misspelled the name, or the Extract Definition File may not be on the disk in the DEFINITION FILE DRIVE (see Chapter 5). If you answer YES, the program reasks the previous question. If NO, the program returns you to the main menu.

NAME OF OUTPUT FILE DEFINITION FILE: Enter the (up to) 8 character filename of the FIL file that defines the output data file (the file to be extracted to). If the output data file does not exist it will be created by the extract program, on the drive named in the output FIL file. If it does exist, it will be overwritten.

OUTPUT FILE DEFINITION FILE NOT FOUND

CONTINUE? (Y OR N): See above under INPUT FILE DEFINITION FILE NOT FOUND.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Extract Definition Menu. Select #1, Link Input and Output Items and Horiz Accums, as the first step in defining summary accumulators, then run #2, Summary Accumulators. ESCAPE returns you to the main menu. RETURN refreshes a garbled screen (needed rarely).

### Link Input and Output Items and Horiz Accums Requests

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: If the purpose of the extraction is only to create summary accumulators, enter zero (0) or press RETURN. This request is explained in Chapter 27.

OUTPUT FILE ITEM NAME: [Name of Data Item on Output File]

INPUT GROUP:

INPUT DATA FILE ITEM NAME/NUMBER (H#=HOR.ACCUM): Enter the name or number of the data item on the input file you wish to "plug into" the output file data item. If you're only creating summary accumulators, the input item should be the same as the output item. That is, there should be a one-to-one correspondence between items on the input file and items on the output file. If you're just creating summary accumulators, there will be no horizontal accumulators used as input to the output file data items (see Chapter 27). Repeat for each data item.

### Summary Accumulators Requests

TOTAL NUMBER OF SUMMARY ACCUMULATORS: Enter the number of summary accumulators you wish to create. If your report uses 3 summary accumulators, at least 3 must be defined for the extract.

SUMMARY ACCUMULATOR NUMBER: n

SUMMARY ACCUMULATOR FUNCTION (+ - \* / %): A summary accumulator can perform math on up to 5 inputs, plus a constant. In the simplest case, where you just want the grand total of a single data item, the function is "+" (with only one input--the data item being summed). The grand

## Chapter 25: Extracting To Create "Summary Accumulators"

totals of several items on the data file may be input to a summary accumulator, with math performed on them as described in Chapter 23.

SUMMARY ACCUMULATOR TYPE (1=NUM, 2=INT): Do you want to express the result of the mathematical computation as an integer or numeric value? (see the similar request in Chapter 23).

INPUT NUMBER: n

OUTPUT DATA FILE ITEM NAME/NUMBER TO ACCUMULATE (0=NONE): Enter the name or number of each input to the summary accumulator. If you're just computing the grand total of an item on the output data file, there is only one input, although math can be performed on up to 5 grand totals, plus a constant. Enter zero (0) to quit entering inputs to the accumulator.

VALUE FOR CONSTANT: A constant value, either positive or negative, integer or numeric, can be input to the summary accumulator (for example, you might multiply the grand total of data item #n times .065, and store the result as a summary accumulator).

## 26. Extracting Selected Records to a New Data File

Purpose: The Extract program can be used to create a new data file that contains only selected records from the original data file. You can select records for inclusion based on RANGE, MATCH, NOT RANGE, and NOT MATCH selection conditions. Up to 10 conditions may be combined using AND, OR, or XOR ("Exclusive OR") conjunctions. This feature allows you to purge a data file of specially flagged data records (paid invoices, departed guests, etc.), or create files that are a selected subset of records on the "input" data file.

Background: Review the Background section of Chapter 25 to learn about extracting in general. To review, extraction creates a new "output" data file from an "input" data file. The File Definition (FIL) File that describes the output data file must exist before you run Define An Extraction. The output data file must never have the same name as the input data file. Make sure there is space for the output data file on the drive named in the output FIL file, before you execute the extraction.

Review Chapter 16, Printing Selected Records, for an explanation of selection conditions. Instead of selecting records for printing on a report, the Extract program selects records for inclusion on the output data file. Extract tests records on the input data file for the RANGE, MATCH, NOT RANGE, or NOT MATCH fit.

Because the output data file cannot have the same name as the input data file, if you plan to repeat the extraction (to purge departed hotel guests from a master list once a week, for example), you may need to rename the output data file before each extraction. In many Analyst applications, the output file becomes the current file, while the input file is no longer processed. But the Extract Definition File (EXT file) expects the input file to have the name of the old input data file, which is no longer the current file. The current file is now the output file from the previous extract. The old input file should be erased and the current file renamed to the same name as the old input file.

For example, the Extract Definition File named PURGE.EXT reads an input data file named OLDGUEST.DAT (defined by OLDGUEST.FIL), and writes an output data file named CURGUEST.DAT (defined by CURGUEST.FIL). CURGUEST.DAT contains all the records on OLDGUEST.DAT, except those that contain the letter "D" in the ARRIVAL STATUS data item ("D" stands for "Departed"). CURGUEST.FIL is the file used to update or sort the guest list. PURGE.EXT removes records for guests who have checked out by ordering a NOT MATCH selection condition on the ARRIVAL STATUS data item, with a match pattern of "D". Before the purge is performed, the operator erases OLDGUEST.DAT, then renames CURGUEST.DAT to OLDGUEST.DAT. If the data files are on drive B, the sequence of commands would be:

```
B>ERA OLDGUEST.DAT
B>REN OLDGUEST.DAT=CURGUEST.DAT
```

The extraction will create the current version of CURGUEST.DAT from records on OLDGUEST.DAT.

## Chapter 26: Extracting Selected Records to a New Data File

### HOW TO EXTRACT SELECTED RECORDS TO A NEW DATA FILE

1. If the sole purpose of the extraction is to create a new file of selected records, the input and output data files will have the same record structure. Therefore, create a duplicate of the File Definition File that defines the input data file; the duplicate should have a different filename, and should differ from the original only in the name (and perhaps drive location) of the data file it describes. The output data file need not be created (but it may well exist) before extraction, since the extraction itself will create it.
2. Select Define An Extraction from the main Analyst menu.
3. Enter the name of the Extraction Definition File you want to create or edit. If the file does not exist, if you misspelled the name, or if it exists but is not on the DEFINITION FILE DRIVE (see Chapter 5), the program asks for confirmation to create it.
4. Enter the name of the input File Definition File (i.e., the name of the file that describes the input data file).
5. Enter the name of the output File Definition File (i.e., the name of the file that describes the output data file).
6. Select #1, Link Input and Output Items and Horiz Accums. This program asks you to link data items on the input file to data items on the output file. It tells you the name of the output file data item, and asks for the name (or number) of the corresponding input data item (or horizontal accumulator; see Chapter 27). If the only purpose of the extract is to create a new file of selected records, the input and output items should be the same.
7. Next, select #4, Record Selection Criteria from the Extract Definition Menu. This program asks for the number of selection conditions and for a definition of each one you request. See Chapter 16, Printing Selected Records for instructions on how to answer the requests.
8. Perform the extraction. See the section in Chapter 25, HOW TO PERFORM AN EXTRACTION.

### MEANING OF REQUESTS AND VALID RESPONSES

#### Define An Extraction Requests

ENTER NAME OF EXTRACTION DEFINITION FILE: See Chapter 25.

EXTRACT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 25.

NAME OF INPUT FILE DEFINITION FILE: See Chapter 25.

INPUT FILE DEFINITION FILE NOT FOUND

CONTINUE? (Y OR N): See Chapter 25.

NAME OF OUTPUT FILE DEFINITION FILE: See Chapter 25.

## Chapter 26: Extracting Selected Records to a New Data File

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Extract Definition Menu. Select #1, Link Input and Output Items and Horiz Accums, as the first step in defining an extraction for selected records, then run #4, Record Selection Criteria. ESCAPE returns you to the main menu. RETURN refreshes a garbled screen (needed rarely).

### Link Input and Output Items and Horiz Accums Requests

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: If the purpose of the extraction is only to extract selected records, enter zero (0) or press RETURN. This request is explained in Chapter 27.

OUTPUT FILE ITEM NAME: [Name of Data Item on Output File]

INPUT GROUP:

INPUT DATA FILE ITEM NAME/NUMBER (H#=HOR.ACCUM): Enter the name or number of the data item on the input file you wish to "plug into" the output file data item. If you're only extracting selected records, the input item should be the same as the output item. That is, there should be a one-to-one correspondence between items on the input file and items on the output file. If you're just extracting selected records, there will be no horizontal accumulators used as input to the output file data items (see Chapter 27). Repeat for each data item.

### Record Selection Criteria Requests

See Chapter 16.

## 27. Changing the Data File Record Structure

Purpose: Through extraction you can increase or reduce the number of data items on a file. You can also change the length and type of some data items. First define the new data file, then link data items on the old file to data items on the new file. New data items can contain data entered later through Create or Modify a Data File, or can be linked to horizontal accumulators calculated during the extraction. Using horizontal accumulators during extraction makes it possible to perform math on input file data items, then "plug" the result into a data item on the output file. A typical application would be to decrease the NUMBER OF ISSUES REMAINING on a magazine subscription when a new issue is mailed. Or, you can add CURRENT PERIOD BALANCE to YEAR TO DATE BALANCE at the end of each period (see the example below) to get a new YEAR TO DATE BALANCE.

Background: Review the Background section of Chapter 25 to learn about extracting in general. To review, extraction creates a new "output" data file from an "input" data file. The File Definition (FIL) File that describes the output data file must exist before you run Define An Extraction. The output data file should never have the same name as the input data file. Make sure there is space for the output data file on the drive named in the output FIL file, before you execute the extraction.

To change the record structure of your data file, run Define a Data File, and describe the data file you want in the usual way. If the old file has 6 data items and you want the new one to have 8, define a new FIL file with 8 data items of the type and length desired. If the old file has 9 data items and you want the new one to have 6, define a new FIL file with six data items.

When you run Define An Extraction, link the items on the new data file with the items on the old data file by stating which data items on the input file to "plug into" which data items on the output file. When the output file contains fewer data items than the input file, not all of the input items can be linked to the output file. Link only the items you want to retain. When the output file contains more data items than the input file, the new data can be: 1) entered for each record later through Create or Modify a Data File, or 2) supplied by a horizontal accumulator defined for the extraction (explained below).

You can link NUMERIC to INTEGER items, and INTEGER to NUMERIC. But you cannot link ALPHA or DATE items to NUMERIC or INTEGER data items. INTEGER and NUMERIC values can be changed to ALPHA values. Truncation occurs if you link a 30 character data item on the input file to a 25 character data item on the output file.

An output file data item can be linked to a horizontal accumulator as well as to a data item on the input file. Horizontal accumulators are defined through Extract Definition Menu selection #1, Link Input and Output Items and Horiz Accum. Input to a horizontal accumulator can come from four sources:

1. One or more NUMERIC or INTEGER data items on the input data file.
2. A lower numbered horizontal accumulator.
3. A level break accumulator defined for the extract using Extract Definition Menu selection #3, Level Breaks and Accum.
4. A constant value you specify.

## Chapter 27: Changing the Data File Record Structure

The math functions (+ - \* / %) can be performed on up to 5 inputs, plus a constant, per horizontal accumulator. See Chapter 23 for a more detailed explanation of horizontal accumulators.

### EXAMPLE 27.1

PROBLEM DEFINITION: The data file named CURBAL.DAT (defined by CURBAL.FIL), has the following record structure:

ITEM NUMBER	DESCRIPTION	ITEM TYPE	LENGTH	RIGHT DIGITS
1	ACCOUNT NUMBER	INTEGER	4	
2	ACCOUNT NAME	ALPHA	25	
3	CURRENT PERIOD BAL.	NUMERIC	11	2

You want to add a new data item to the file that keeps track of the account balance for the year-to-date. At the end of each accounting period you want to add the current period balance to the year-to-date balance, and reset the current period balance to zero.

SOLUTION: First, add the new data item by defining an output data file named YTD BAL.DAT (defined by YTD BAL.FIL). It should have this record structure:

ITEM NUMBER	DESCRIPTION	ITEM TYPE	LENGTH	RIGHT DIGITS
1	ACCOUNT NUMBER	INTEGER	4	
2	ACCOUNT NAME	ALPHA	25	
3	CURRENT PERIOD BAL.	NUMERIC	11	2
4	YEAR TO DATE BAL.	NUMERIC	11	2

Define an Extract Definition File named CHANGE.EXT, with CURBAL.FIL as the input FIL file, and YTD BAL.FIL as the output FIL file. Link input item #1 to output item #1, input item #2 to output item #2, and input item #3 to output item #3. Since output item #4 is a NUMERIC item not linked to an input file data item, it will default to "0.00"

Perform the extraction defined by CHANGE.EXT to add the YEAR TO DATE BALANCE data item to the input file. The new file is named YTD BAL.DAT.

Now define the extraction to be performed at the end of the accounting period. Name the Extract Definition File PERIOD.EXT. The input File Definition File should be YTD BAL.FIL. The output FIL file should be named NEWYTD.FIL and should define NEWYTD.DAT. Create NEWYTD.FIL, which is the same as YTD BAL.FIL except for the name of the data file it defines, before you define PERIOD.EXT (see Background, Chapter 25). After performing the PERIOD extract, erase YTD BAL.DAT and rename NEWYTD.DAT to YTD BAL.DAT. Use YTD BAL.FIL to update YTD BAL.DAT with the current period's accounting transactions.

## Chapter 27: Changing the Data File Record Structure

The PERIOD extract requires one horizontal accumulator. The math function is +. The inputs to the horizontal accumulator are input file data items #3 (CURRENT PERIOD BALANCE) and #4 (YEAR TO DATE BALANCE). Horizontal accum #1 should be linked to output data file item #4. That is, the current period balance should be added to the year to date balance, and the result "plugged into" the Year-to-Date Balance data item on the output file. Link input data item #1 to output data item #1, and input item #2 to output item #2. Do not link input item #3 to output item #3; this has the effect of "zero'ing out" the CURRENT PERIOD BALANCE on the output file.

### HOW TO CHANGE THE DATA FILE RECORD STRUCTURE

1. Since the purpose of the extract is to change the data file record structure, the input and output data files will most likely not have the same record structure. Therefore, run Define a Data File to create a File Definition File (FIL file) that describes the desired output file.
2. Select #5, Define an Extraction, from the main Analyst menu.
3. Enter the name of the Extract Definition File you want to create or edit. If the file does not exist, if you misspelled the name, or if it exists but is not on the DEFINITION FILE DRIVE (see Chapter 5), the program asks for confirmation to create it.
4. Enter the name of the input File Definition File (i.e., the name of the file that describes the input data file).
5. Enter the name of the output File Definition File (i.e., the name of the file that describes the output data file).
6. The Extract Definition Menu should appear next. Select #1, Link Input and Output Items and Horiz Accum. The program displays the name of each item on the output data file and asks which input item or horizontal accumulator should be linked to it. If the output data item is not linked to an input item or horizontal accum, it defaults to zero (0) for NUMERIC or INTEGER items, all blanks for ALPHA items, and the current system date for DATE data items. If horizontal accumulators are linked to output file data items, the program asks you to define the math function and inputs for each horizontal accumulator requested. If a horizontal accumulator uses a Level Break accumulator as input, run selection #3, Level Breaks and Accumulators.
7. Print the Extract Specifications report by selecting #6, Print Extract File, from the Extract Definition Menu. The report requires 132 column paper.
8. Perform the extraction you defined.

## Chapter 27: Changing the Data File Record Structure

### MEANING OF REQUESTS AND VALID RESPONSES

#### Define An Extract Requests

ENTER NAME OF EXTRACTION DEFINITION FILE: See Chapter 25.

EXTRACT FILE NOT FOUND

CREATE ONE? (Y OR N): See Chapter 25.

NAME OF INPUT FILE DEFINITION FILE: See Chapter 25.

INPUT FILE DEFINITION FILE NOT FOUND

CONTINUE? (Y OR N): See Chapter 25.

NAME OF OUTPUT FILE DEFINITION FILE: See Chapter 25.

OUTPUT FILE DEFINITION FILE NOT FOUND

CONTINUE? (Y OR N): See Chapter 25.

ENTER NUMBER OF FUNCTION DESIRED: Asked at the Extract Definition Menu.

Select #1, Link Input and Output Items and Horiz Accums, as the first step in defining an extraction. Also run program #3, Level Breaks and Accumulators, if you have defined a horizontal accumulator that requires a level break accumulator as input. The same Extract Definition File may also include specifications for extracting selected records and creating summary accumulators.

#### Link Input and Output Items and Horiz Accums Requests

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS: Enter the total number needed for the report. The program will ask you to define each one later. The maximum is 5.

OUTPUT FILE ITEM NAME: [Name of Data Item on Output File]

INPUT GROUP:

INPUT DATA FILE ITEM NAME/NUMBER (H#=HOR. ACCUM): Enter the name or number of the data item on the input file to link to the output file data item. If a horizontal accumulator is to be linked to the output file item, type the letter "H", followed by the number of the horizontal accumulator (for example, "H3" or "h1"). Repeat for each data item.

HORIZONTAL ACCUMULATOR NUMBER: n

HORIZONTAL ACCUMULATOR FUNCTION (+ - \* / %): See Chapter 23.

INPUT NUMBER: n

TYPE OF INPUT:

TYPE AND NUMBER OF INPUT (H#=HOR, B#=BRK, I#=IN. ITM, 0=NONE): Enter the type and number of the input or zero (0) to quit defining inputs. For example, if the first input to the horizontal accumulator is data item #2 (on the input file), enter "i2". If the second input is level break accumulator #5, enter "b5". If level break accumulator #5 has not been defined yet, you must do so before performing the extract. See Chapter 23.

VALUE FOR CONSTANT: See Chapter 23.

Chapter 27: Changing the Data File Record Structure

Level Breaks and Accums Requests

See Chapter 20.

## 28. Converting To and From CBASIC Data Files

Purpose: Analyst allows you to produce reports on data files created by programs written in the CBASIC programming language. "CBASIC data files", as they are called, store data in a different format than Analyst. CBASIC data files must be converted to the Analyst file format before Analyst's data entry, report writing, and extract facilities can be used. You can also convert Analyst files to the CBASIC file format. The ability to convert to and from CBASIC data files makes it possible to interface Analyst with SSG's NAD Name and Address System, and SSG's full line of financial software packages.

Background: Data records on a CBASIC file are also made up of data items. To convert from the CBASIC format to the Analyst format, you define an Analyst data file that contains the same number and type of data items. The length you specify for each should be the maximum length of the CBASIC data item. The documentation for most SSG software packages includes "File Specifications" charts that tell you the name, type, and maximum length of each data item on the file.

CBASIC data files sometimes contain "header records" in addition to data records. Header records are the first records on the data file; they usually contain such information as the number of records on the file (which may or may not include the header records themselves), the date the file was last processed, and a "flag" that tells if a mandatory report has been run. Before you can convert an Analyst data file to a CBASIC data file, the header records must be described. Although CBASIC data files can contain more than one header record, most contain only one, and many contain none at all. You do not need to describe the header records when going from the CBASIC to the Analyst format; just state how many there are.

Analyst enables you to convert CBASIC files to Analyst files primarily so you can produce reports that are different from those produced by the system that created the file. We strongly recommend against using the Analyst data entry facilities to change data on the file, since doing so may violate the integrity of the data base. If you do want to continue processing the file with your CBASIC program after changing the data with Analyst, make sure the header record information (if any) reflects the new status of the file. Simply put, it is not a good idea to convert, say, the Accounts Payable Detail File to the Analyst format, change data on the file, then change it back to the CBASIC format for further processing.

### HOW TO CONVERT A CBASIC FILE TO THE ANALYST FORMAT

1. With the File Specifications chart, or other programming documentation, as a guide, define the name, type, and maximum length of each data item on the CBASIC file using the Define A Data File program.
2. Select #10, Convert Data File Format, from the Analyst main menu.
3. When the Data File Conversion Menu appears, select #2, Convert CBASIC Data File to Analyst File Format.
4. Enter the name of the File Definition File that defines the CBASIC file. Analyst does not ask for the FIL file name if you have created, edited, or used a File Definition File in the current session. It assumes you want the last one used, unless you select #11, New

## Chapter 28: Converting To and From CBASIC Data Files

Definition Files, from the main menu before selecting #10, Convert Data File Format.

5. Analyst displays the name of the input CBASIC file and the name of the output Analyst file, informs you that the CBASIC file will be renamed to a filetype of "CB" (e.g., APDET.CB), and asks for confirmation to proceed.
6. Analyst asks for the number of header records on the CBASIC file, then starts the conversion. When the conversion is finished, the Data File Conversion Menu returns.

### HOW TO CONVERT AN ANALYST FILE TO THE CBASIC FILE FORMAT

1. Select #10, Convert Data File Format, from the Analyst main menu.
2. When the Data File Conversion Menu appears, select #1, Convert Analyst Data File to CBASIC File Format.
3. Enter the name of the File Definition File that defines the Analyst file you want to convert. Analyst does not ask for the FIL file name if you have created, edited, or used a FIL file in the current session. It assumes you want the last one used, unless you select #11, New Definition Files, from the main menu before selecting #10, Convert Data File Format.
4. Analyst displays the name of the input data file and the name of the output CBASIC data file it will create. The output file will have the same filename as the input file, but a filetype of "CB". Confirm that you want to proceed with the conversion.
5. State the number of header records on the CBASIC data file.
6. Describe the data items on each header record. Enter the type of each data item (INTEGER, NUMERIC, ALPHA/DATE, or RECORD COUNTER). Analyst will create the CBASIC data file with the header records defined. If you wish to process the CBASIC file with your CBASIC program, you'll have to enter the actual header record values with an editor (except for the record count, which Analyst computes for you). If the header includes a record counter, Analyst asks if the value should include or exclude header records.

### MEANING OF REQUESTS AND VALID RESPONSES

#### Convert CBASIC Data File to Analyst File Format Requests

ENTER NAME OF FILE DEFINITION FILE: Enter the name of the FIL file that defines the input CBASIC file. The last File Definition File created, edited, or used in the current session is assumed, unless you select #11, New Definition Files, from the main menu before you run this program.

FILE DEFINITION FILE NOT FOUND

TRY AGAIN WITH ANOTHER NAME? (Y OR N): You may have misspelled the FIL file name, or it may not be on the disk in the DEFINITION FILE DRIVE (see

## Chapter 28: Converting To and From CBASIC Data Files

Chapter 5). Type "Y" to re-enter the name, or "N" to return to the menu.

INPUT CBASIC DATA FILE: [Name of input CBASIC data file]  
OUTPUT AN VER 2 DATA FILE: [Name of output Analyst data file]  
AT END, CBASIC DATA FILE WILL HAVE A FILE-TYPE OF CB  
PROCEED WITH CONVERSION? (Y OR N): If the data file names are incorrect, you may abort the conversion by answering No to this request.

NUMBER OF HEADERS IN CBASIC FORMAT FILE: Analyst does not store the CBASIC header record information on the Analyst file, but it must know how many header records are on the input file in order to remove them. Usually there is only one header record. SSG's NAD Name and Address System files have zero header records. SSG's AP vendor and AR customer files also have zero header records.

### Convert Analyst Data File to CBASIC File Format Requests

ENTER NAME OF FILE DEFINITION FILE: Enter the name of the FIL file that defines the data file you want to convert to the CBASIC format. The last File Definition File created, edited, or used in the current session is assumed, unless you select #11, New Definition Files, from the main menu before selecting #10, Convert Data File Format.

FILE DEFINITION FILE NOT FOUND  
TRY AGAIN WITH ANOTHER NAME? (Y OR N): You may have misspelled the FIL file name, or it may not be on the disk in the DEFINITION FILE DRIVE (see Chapter 5). Type "Y" to re-enter the name, or "N" to return to the menu.

INPUT AN VER 2 DATA FILE: [Name of input Analyst file]  
OUTPUT CBASIC DATA FILE: [Name of output CBASIC file]  
PROCEED WITH CONVERSION? (Y OR N): If the data files named are incorrect, you may abort the conversion by answering No to this request. The CBASIC file created by this program will have the same filename as the input Analyst file, but a filetype of "CB" (you can rename the CBASIC file to another name after the conversion, if necessary).

NUMBER OF HEADERS IN CBASIC FORMAT FILE: How many header records should the CBASIC data file contain? You will be asked to define the structure of each. Analyst does not actually create the header records with the appropriate data filled in, but does create them in the proper format. You can enter actual values after the conversion using an editor. If the header record includes a count of the number of records on the file, Analyst will create the header with this information included.

SEPARATE HEADER ITEMS WITH COMMAS (E.G.: R,I,N,A)  
HEADER FORMAT (N=NUM, I=INT, A=ALPHA/DATE, R=# RECS): Define the type of each data item on the header record, starting with the leftmost data item and working to the right. Indicate the item type with the appropriate letter, and separate each item from the one before it with a comma.

For example, The SSG Accounts Receivable Invoice Batch file (ARINV.001) has one header record with three data items. The file specifications are reproduced below:

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FIELD	CHARACTERS	START	COMMENTS
INV.NO.RECS	1-3	1	Number of Records
INV.ENTRY.DATE\$	6	VARIABLES	YYMMDD
INV.PROOFED	1-2	VARIABLES	(0=True, -1=False)

The first is a "counter" of the number of records on the data file (including the header record itself), so type "R". The next is a date, so type "A" (a "\$" at the end of a variable name means it is a string variable, which is the same as ALPHA). The last item is NUMERIC (a numeric variable name does not have a symbol appended to the name; a variable name that represents an integer has a "%" sign appended). Your response should be:

```
SEPARATE HEADER ITEMS WITH COMMAS (E.G.: R,I,N,A)
HEADER FORMAT (N=NUM, I=INT, A=ALPHA/DATE, R=# RECS)
CURRENT VALUE: NONE
NEW VALUE:      r,a,n
```

NUMBER OF RECORDS FIELD INCLUDES HEADER IN RECORD COUNT (Y OR N): If one of the header record data items is a record counter (as in the above example), state whether the counter should include the header record itself in the count of the number of records on the file.

## 29. Changing From Analyst Version 1.0 to 2.0

Purpose: After a simple conversion program is run, data files created with Analyst version 1.0 are completely compatible with Analyst version 2.0. The conversion program is required because data is stored differently in version 2.0 than in version 1.0.

Background: To convert a data file created with Analyst version 1.0 to the version 2.0 format you must run the Convert Data File Format program. The program named Convert Version 1.0 Analyst Data Files to Version 2.0 reads an input Analyst 1.0 file (in the "RP" file format, see your version 1.0 Analyst manual), and writes out a new file in the 2.0 format. If you were using Analyst 1.0 to print reports on CBASIC data files, convert the CBASIC file to the Analyst 2.0 format as described in Chapter 28.

The conversion program also converts the Analyst version 1.0 File Definition (FIL) file to Analyst 2.0 standards.

Analyst expects the version 1.0 data file to be in the drive named in the 1.0 FIL file that defines it. The FIL file is expected to be on the DEFINITION FILE DRIVE (see Chapter 5).

### HOW TO CONVERT VERSION 1.0 DATA FILES TO THE 2.0 FORMAT

1. Make sure the old Analyst data file is on the drive named in the version 1.0 File Definition File that defines it. Make sure the version 1.0 FIL file is on the DEFINITION FILE DRIVE (see Chapter 5). The new version of the data file will be created on the drive named in the old FIL file; make sure there is enough space for both the old file and the new file.
2. Select #10, Convert Data File Format, from the Analyst main menu.
3. The Data File Conversion Menu should appear next. Select #3, Convert Version 1.0 Analyst Data File to Version 2.0.
4. Enter the name of the version 1.0 FIL file that defines the data file you want to convert to the new format.
5. The program shows the names of the input and output data files, then asks for confirmation to proceed.
6. When the conversion is complete, the menu returns.

Chapter 29: Changing From Analyst Version 1.0 to 2.0

MEANING OF REQUESTS AND VALID RESPONSES

ENTER NAME OF VERSION 1.0 FILE DEFINITION FILE: Enter the (up to) 8 character filename of the version 1.0 FIL file.

AN VER 1 AND AN VER 2 FILE DEFINITION FILES: [Name of FIL file]

INPUT AN VER 1 DATA FILE: [Name and location of input data file]

OUTPUT AN VER 2 DATA FILE: [Name and location of output data file]

AT END, AN VER 1 FILE DEFINITION FILE WILL HAVE A FILE-TYPE OF FLO

AT END, AN VER 1 DATA FILE WILL HAVE A FILE-TYPE OF OLD

PROCEED WITH CONVERSION? (Y OR N): If the FIL and data file names are correct, type "Y" to proceed with the conversion. The old FIL file will be renamed to a filetype of "FLO" (for "old FIL file"), and the old data file will be renamed to a filetype of "OLD".

## 30. Installing Analyst on Your Computer

Installing Analyst on your computer is easy. Make sure your computer system meets the minimum hardware and software requirements. Then prepare at least two blank disks according to the instructions provided with your machine. Make two copies of the Analyst "distribution" disk you received from your dealer or SSG. Label one your Analyst "MASTER DISK" and the other your Analyst "WORK DISK". Store the distribution disk safely away and use the MASTER disk only to make additional WORK disks. Use the WORK disks for your actual processing. Finally, rename the run-time interpreter program on both the MASTER and WORK disks. Instructions that work for most computers appear below.

### STEP ONE: DOES YOUR COMPUTER MEET THESE REQUIREMENTS?

- (1) At least 48K ("kilobytes") of Random Access Memory (RAM).
- (2) At least one floppy disk drive with a recommended minimum capacity of over 250K storage.
- (3) A CRT video device with keyboard and minimum dimensions of 16 rows by 64 columns.
- (4) A printer with at least 80 columns is recommended. It must be able to skip to the top-of-form in response to the ASCII form-feed character.
- (5) The CP/M Operating System, or one compatible with CP/M.

### STEP TWO: PREPARE BLANK DISKS FOR YOUR COMPUTER

Many computers require new disks to be "formatted" before use. Ask your dealer, or someone familiar with the computer if you must format new disks. Any disk that you want to put in drive A must have a copy of the operating system on it. It is a good idea to put an operating system on all of your disks, as a normal part of the disk preparation procedure. Putting an operating system on your disk is called "SYSGEN'ing" a disk (for "SYSem GENeration").

To format a disk you need the program FORMAT.COM. To put an operating system on a disk you need SYSGEN.COM. These programs (or similar ones) normally are supplied on the disk that contains your CP/M Operating System. (Once your computer equipment is set up it is a good idea to put these, and other "utility" programs on a separate disk called a "system" or "utility" disk.)

HOW TO FORMAT A DISK: Put a disk in A that contains an operating system (i.e., that has been SYSGEN'ed) and the FORMAT program. Put the disk to be formatted in drive B (it should be "write-enabled", see Chapter 3). Press RESET or give the command CONTROL-C. Type "FORMAT" (the name of your formatting program may differ slightly) at the CP/M prompt, then press RETURN. Answer the questions asked by the program as directed by the documentation for your equipment (see the CP/M "Features and Facilities" manual). Because formatting destroys any data that may have been on the disk, be sure you are formatting the

## Chapter 30: Installing Analyst on Your Computer

correct disk before you start.

HOW TO SYSGEN A DISK: Although the actual operation (and even the name) of SYSGEN may vary from machine to machine, the basic idea is to copy the operating system from a "source" disk (that has already been SYSGEN'ed) to a "destination" disk. Put a disk in A that contains an operating system and the SYSGEN program. Put the disk to be SYSGEN'ed in drive B (it should be "write-enabled", see Chapter 3). Press RESET or give the command CONTROL-C. Type "SYSGEN" at the CP/M prompt, the press RETURN. Answer "A" when asked for the SOURCE, "B" when asked for the DESTINATION. Since the source and destination disks are already in the proper drives, press RETURN when prompted to put them there. To end the program after answering the source and destination requests, press RETURN.

### STEP THREE: MAKE WORKING COPIES OF ANALYST

Never use the disk you received from your dealer or SSG for actual processing. Make an exact copy of the original "distribution" disk, label the copy your MASTER DISK, then make working copies of Analyst from the MASTER disk.

HOW TO MAKE AN ANALYST MASTER DISK: Place a disk that contains an operating system and the CP/M PIP program on drive A. Place the Analyst "distribution" disk in drive B (preferably it should be write-protected). Press RESET or give the CONTROL-C command. Make sure there is room on A for the files on B (use the CP/M STAT command, see Chapter 31). Give the command:

```
A>PIP A:=B:*. *[ov]
```

Do not interrupt the machine until the CP/M prompt returns. If you receive a VERIFY ERROR, make sure the disk is not full. If the verify error was not caused by a full disk, try the procedure again. If it fails again, seek help from an experienced person. If you receive a BDOS BAD SECTOR error remove the Analyst disk immediately; this error message (issued by the operating system) often indicates a serious problem with your computer hardware.

HOW TO MAKE ANALYST WORK DISKS: Place your Analyst MASTER disk in drive A and a blank disk (formatted, SYSGEN'ed, and write-enabled) on drive B. Press RESET or give the CONTROL-C command. Type the command below at the CP/M prompt character and press RETURN:

```
A>PIP B:=A:*. *[ov]
```

When the copying is complete the prompt returns.

### STEP FOUR: RENAME THE RUN-TIME INTERPRETER PROGRAM

Two versions of the run-time interpreter program are supplied with every Analyst. One is for operating Analyst under CP/M version 1.4, the other for CP/M version 2.2 of MP/M (check with your dealer if you don't know what version you're using). The files that hold these programs are named AN1.COM and AN2.COM respectively. Before you begin you must rename

## Chapter 30: Installing Analyst on Your Computer

the one that is right for you to a file named AN.COM.

If you only have one computer at your installation, or if all the computers use the same version of CP/M, you'll want to erase the unused version from your MASTER disk (but not from the "distribution" disk!). Otherwise you should leave them both on the MASTER disk and rename them back and forth when you change operating systems. If you need space on your WORK disk you can erase the unneeded copy of the run-time interpreter. It takes up about 20K of disk storage.

No harm will occur if you try to run Analyst with the wrong run-time interpreter program. A message will tell you that you have the wrong version. If you do not rename the run-time interpreter program to AN.COM, Analyst will not recognize its startup command (typing AN at the CP/M prompt).

HOW TO RENAME THE RUN-TIME INTERPRETER: Place your MASTER (or WORK) disk on drive A. Press RESET or give the CONTROL-C command. Type one of the commands below:

```
A>REN AN.COM=AN1.COM           [for CP/M ver 1.4]
```

```
A>REN AN.COM=AN2.COM           [for CP/M ver 2.2]
```

and follow with RETURN.

### STEP FIVE: MODIFY THE ANPR1.101 FILE (OPTIONAL)

A "parameter file" named ANPR1.101 is created on the currently logged drive when one is not found (as at first time startup). The parameter file holds information on Analyst system standards that may be changed to suit your computer setup. The file holds the DEFINITION FILE DRIVE location and the screen size (see Chapter 5), in addition to such items as maximum number of titles, data items, detail lines per record, etc.

Before creating the file, Analyst checks the amount of RAM (or "main") memory available on your computer. If it is less than 48K, you will have to make some changes to the standard values stored on the parameter file. Analyst will initiate a program that recommends maximum values based on the RAM available, and lets you set them to suit your needs. Note that increasing certain parameter values without sufficient RAM is likely to cause an OM (out of memory) error, which will cause Analyst to "crash" in mid-processing.

If you increase a system standard (such as the number of detail lines per record, number of horizontal accumulators, etc.), it is a good idea to decrease some other standard value. For example, when you increase the number of data items per record, you might decrease the number of report titles, selection conditions, and/or level break accumulators. Since the NUMBER OF PRINT COLUMNS is a two dimensional array, reducing that parameter by 5 is the same as reducing the NUMBER OF REPORT TITLES by 10. Notice that if you change the NUMBER OF SUMMARY ACCUMS, you must change the NUMBER OF CROSS FOOT ACCUMS to the same value (same for NUMBER OF DATA ITEMS and NUMBER OF LOOKAHEAD ITEMS).

If you want to increase certain standards or otherwise change a

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parameter file value, and have sufficient Random Access Memory, you can edit the ANPR1.101 file with an editor or other suitable program, such as DDT.COM, the CP/M debugging tool (the program described above is initiated only if you have less than 48K of RAM). Pay attention to the remarks in the table of file specifications below.

PARAMETER NAME	DEFAULT VALUE	REMARKS
pr1.max.titles%	50	
pr1.max.breaks%	10	
pr1.max.accums%	50	
pr1.max.conds%	10	
pr1.max.columns%	50	
pr1.max.items%	50	
pr1.max.item.len%	132	
pr1.max.look.items%	50	
pr1.max.xfoot%	10	maximum number of accums
pr1.max.xfoot.items%	5	maximum number of inputs
pr1.max.horiz%	5	maximum number of accums
pr1.max.horiz.items%	5	don't change this value
pr1.max.horiz.len%	14	
pr1.max.sum.accums%	10	must equal pr1.max.xfoot%
pr1.max.accum.grps%	5	number of types of accums
pr1.max.date.formats%	2	
pr1.max.item.types%	7	
pr1.min.rec.len%	17	must not be decreased
pr1.max.skip.lines%	9	
pr1.max.lines.per.page%	32000	
pr1.max.lines.per.rec%	5	
pr1.max.drives\$	Z	
pr1.hdr1\$	STRUCTURED SYSTEMS GROUP, INC.	
pr1.hdr2\$	NULL	
pr1.hdr3\$	ANALYST	
pr1.date.mo%	1	1,3,2 yields date format of
pr1.date.yr%	3	MM/DD/YY; 2,3,1 yields
pr1.date.dy%	2	DD/MM/YY
pr1.search.table.size1%	100	
pr1.max.rec.len%	255	cannot sort if larger
pr1.def.file.drives\$	B	
pr1.big.screen%	-1	0 for 16 x 64 screen
pr1.real.dummy1%	0	dummies are for future en-
pr1.real.dummy2%	0	hancements or changes
pr1.integer.dummy1%	0	
pr1.integer.dummy2%	0	
pr1.integer.dummy3%	0	
pr1.integer.dummy4%	0	
pr1.integer.dummy5%	0	
pr1.integer.dummy6%	0	
pr1.string.dummy1\$	NULL	
pr1.string.dummy2\$	NULL	
pr1.string.dummy3\$	NULL	
pr1.string.dummy4\$	NULL	
pr1.string.dummy5\$	NULL	
pr1.string.dummy6\$	NULL	

## 31. Summary of CP/M Operating System Commands

### WHAT IS THE CP/M OPERATING SYSTEM?

An operating system is a set of programs that controls the computer's internal operation. It is the connection between the "applications" programs (such as Analyst, Accounts Payable, Name and Address, etc.) and the computer hardware or equipment. Think of the operating system as the "chauffeur" and the applications programs as "passengers". The passengers direct the chauffeur, but the chauffeur actually drives the car.

Analyst is designed to run under the CP/M operating system (CP/M is a product of the Digital Research Company). CP/M is documented by six manuals. The first of the six, "Features and Facilities", contains useful and important information relating to the setup and operation of Analyst. Although CP/M is a powerful system with extensive features, you need only know a few commands to become skilled at operating the applications programs. Of most use are the DIR, REN, ERA, TYPE, PIP, STAT, SYSGEN, and FORMAT commands. They are explained briefly a little later.

### "BOOTING UP" AND "LOGGING ON" EXPLAINED

When you first turn your computer on, its random access memory (RAM) is empty. Since in this state the computer can do nothing, a feature has been built into the microcomputer hardware that directs it to look on a predetermined section of a certain disk drive to find what to do next. If everything is working normally, your computer should look on the outer two tracks of the disk in drive A, find the CP/M operating system (if it has been SYSGEN'ed onto the disk; see Chapter 30 or the CP/M documentation for details), load it into random access memory, and then display "A>" on the screen, which indicates it is ready to go to work. This process is called "booting up" since the computer is, in effect, lifting itself "up" (making itself intelligent) by its own bootstraps.

The "A>" character is called a "prompt". When the A> prompt appears on the screen, the operating system is said to be "logged on" to the A disk drive. While logged on to the A drive, you can access programs or data files on that disk by typing the program name. To request a file on another disk (unless done automatically by a program you are using, or through the more advanced features of CP/M), first "log on" to that disk by typing the drive name (usually the letter "B" on a two drive system), followed by a colon (:) and a carriage return, and then type the program name. The carriage return is simply the RETURN (or ENTER) key as it is on a typewriter.

For example,

```
A>          [CP/M prompt character]
A>B:        [user types "B:", then RETURN]
B>          [B is now the currently logged drive]
```

To return to the A drive, enter:

```
B>A:        [user types "A:", then RETURN]
A>          [A is now the currently logged drive]
```

## Chapter 31: Summary of CP/M Operating System Commands

### GIVING COMMANDS ON THE "COMMAND LINE"

The imaginary line that runs to the right of the CP/M prompt character is called the "command line". To give one of the CP/M commands, to call up the Analyst system, or to run the QSORT sort routine, you type the appropriate command on the command line. The example of running Analyst given below assumes you are logged on to the A drive, and that the program named AN.COM is on the disk in that drive:

```
A>AN 6/25/81
```

After giving a command you must press the RETURN key. RETURN tells the computer it may continue. If you make a mistake while typing a command, you can erase the erroneous characters with the BACKSPACE key (some machines use the DELETE key). You can also cancel a command (before you press RETURN) by the commands CONTROL-X or CONTROL-U (after the CTRL-U or CTRL-X command, the prompt character may not reappear; if you press RETURN it will return). To give a CONTROL command, hold down the CONTROL key (CTRL or CTL on some keyboards) and type the letter at the same time. The CONTROL key works like the SHIFT key on a typewriter.

### CP/M FILE NAMES

Programs and data are stored on disk in "files". Each file has a name that indicates what it contains. Names have two parts: an 8 character "filename" and a 3 character "filetype". The filename is like a person's first name. The filetype is like a person's last name. CP/M displays the names of the files currently on disk when you give the DIR command. When you are asked to type the complete name of a file, type the first and last names, separated by a period:

```
CUSTOMER.DAT
```

A filename can be less than 8 characters, and a filetype can be less than 3 characters. Neither filenames nor filetype may contain the following characters:

```
. , : = ; * ? [ ] < >
```

Certain filetypes have special meaning to Analyst and should not be used. They include: FIL, RPT, SRT, EXT, ASC, \$\$\$, OLD, and FLO.

### THE CP/M COMMANDS

Besides coordinating the activities of the computer and its "peripheral" devices (such as the printer, video device, etc.), the CP/M operating system can tell you which programs or data files are on disk (DIR), how much room is left on disk, or the size of any given file (STAT). It can copy files from one disk to another (PIP), erase files from disk (ERA), rename files from one name to another (REN), and even type out the contents of some files (TYPE). Other commands such as SYSGEN and FORMAT perform utility functions that prepare new disks for processing.

## Chapter 31: Summary of CP/M Operating System Commands

A brief explanation of each command is given below. Some commands have advanced uses not explained here (see the CP/M Features and Facilities manual). Some are "transient" commands, while others are "built in". Transient commands are actually programs that must be moved onto your disk at some point (with PIP, or by some other method) before they can be issued. Built in commands do not appear in the disk directory (as do transient commands), since they are put on the disk by the SYSGEN operation.

**DIR (DIRectory):** Typing DIR on the command line lists the names of the programs and data files on the disk in the currently logged drive. To display the files on another disk drive, you give a "drive reference" followed by a colon after typing DIR (for example, A>DIR B:). Remember to press RETURN. DIR is a "built in" command.

**ERA (ERAsE):** The ERA command erases files from disk. To erase a file, type ERA followed by the complete name of the file you want to erase (for example, A>ERA CUSTOMER.BAK). Before you press RETURN to execute the command, make sure you are erasing the correct file. Once erased, a file cannot be reclaimed. ERA is a "built in" command.

**REN (REName):** The REN command is used to rename files. To rename a file from OLDNAME.DAT to NEWNAME.DAT you type the command: REN NEWNAME.DAT=OLDNAME.DAT. If a file called NEWNAME.DAT already exists, an error message is issued. The REN command is a "built in" command.

**TYPE:** The TYPE command types out the contents of a file on your screen. Not all files can be typed out (notably files that contain programs); those that can't usually display "garbage" on the screen. To type out a file, type the word TYPE followed by the full name of the file (for example, A>TYPE CUSTOMER.DAT). If the file is large its contents will "scroll" by on the screen. You can stop and start the scrolling by the command CTRL-S. CP/M also allows you to "echo" whatever appears on the screen to your printer by the command CTRL-P. To turn off the echo'ing, give the CTRL-P command again. TYPE is a "built in" command.

**PIP (Peripheral Interchange Program):** PIP copies files from one disk to another. It is used most often to create backup copies of your data files, and to copy programs onto another disk. PIP is a "transient" command, which means it must be copied onto your disk before you can use it ("built in" commands are put on disk by the SYSGEN program and do not appear when you give the DIR command).

To copy a file named CUSTOMER.DAT from a disk in drive A to a disk in drive B you would type:

```
A>PIP B:=A:CUSTOMER.DAT[V]
```

To understand the command say to yourself, "Make the B disk the same as the A disk with respect to the CUSTOMER.DAT file, and verify that the information was transferred correctly". Putting "v" in square brackets at the end of the command is optional; it

## Chapter 31: Summary of CP/M Operating System Commands

instructs PIP to check for an accurate copy. If a file by the name of CUSTOMER.DAT already exists on the disk in B, its contents are replaced by the contents of the CUSTOMER.DAT file on A.

**STAT (STATus):** The STAT command tells you how much space is left on disk, and how large a given file is. Disk space and file size are measured in "bytes". One byte is the same as one character. The expression "85K" stands for about 85,000 characters. A single density 8" floppy disk usually holds a total of 240K of data. The capacity of a double density 8" disk may go as high as 500 to 1000K. The smaller 5 1/4" disks may hold from 170 to 350K or more. STAT is a "transient" command.

To find out how much space is left on the disk in the currently logged drive, type STAT and press RETURN. To find out how much space is left on another disk drive, type STAT followed by the drive name and a colon:

```
A>STAT B:
```

To find out the size of a file, type STAT followed by the full name of the file. For example,

```
A>STAT CUSTOMER.DAT
```

**FORMAT:** Often new disks must be formatted before they can be used for processing. Whether formatting is necessary depends on your computer equipment (8" single density disks normally do not need to be formatted). Follow the formatting instructions that are appropriate for your machine. Because formatting destroys all data on the disk, be sure you are formatting the right disk. FORMAT is a "transient" command.

**SYSGEN (SYStem GENeration):** The SYSGEN command puts the CP/M operating system on your disk (including the "built in", but not the "transient" commands). In order to "boot up" (i.e., start) your computer, the disk you put in the A drive must have been SYSGEN'ed. Normally you should SYSGEN all of your disks after formatting them. Chapter 30 explains how to use SYSGEN. SYSGEN is a "transient" command.

## 32. Calculating Disk Storage Space

When we speak of disk "storage", just what is it that is being stored? The simple answer is "data", but what is data? Data can be a letter that is part of a person's name (the "a" in "James"), a name that is part of a customer record ("James" in "James Greene, \$200, 42R"), or a customer record that is part of a file:

James Greene	200	42R
Ronald Ortiz	350	44R
Alan Sharp	600	40L
Tom Thumb	150	36S
etc...		

The computer stores information typed in response to requests issued by Analyst. When you type a name, for example, each letter is recorded on disk according to a code of "on's" and "off's" (called "bits"). If a tiny spot of magnetic material is magnetized in one direction it means "on", if the other direction it means "off". Because the operating system takes care of translating data to and from this "machine language", you never see the "on's" and "off's". All you need to know is that every letter, number, or symbol (the "ASCII Code Set") is represented by a unique pattern of eight on's and off's (called a "byte"). One "byte" of data is the same as one alphabetic, numeric, or symbolic character (the "a" in "James", the "2" in "200", etc.).

Since it is inconvenient to talk in terms of the number of bytes stored on disk, people talk instead in terms of the number of "K" or "Kilobytes" stored or remaining on disk. In casual conversation, and for the sake of easy calculation, people refer to a kilobyte as being made up of 1,000 bytes. In fact, for reasons that aren't important to us here, a kilobyte actually equals 1024 bytes. In this manual we'll use 85K to mean about 85,000 characters.

Disk storage capacity is measured in kilobytes, or the number of "K". The number of K able to be stored on disk depends mostly on the "disk format". Although there are almost as many disk formats as there are brands of computer (how unfortunate for all of us!), Structured Systems Group currently distributes Analyst on four of the more common formats (your dealer may have converted your copy to a different format). The table below gives the approximate capacity of each (after being formatted and SYSGEN'ed), plus a few more:

FORMAT:	CAPACITY IN "K":
North Star 5 1/4 " DD*	160K
IBM 3740 8" Single Density	240K
Micropolis Mod II 5 1/4" DD*	296K
Dynabyte 5 1/4" DD*	298K
Typical 8" DD*	600K to 1000K
Typical "hard" disk drive	5,000K to 8,000K

\*DD = Double Density

Disk storage space is taken up by programs and data files. A typical

## Chapter 32: Calculating Disk Storage Space

Analyst WORK disk might hold the Analyst programs (filetype of SSG), the run time interpreter program (AN.COM), several utility programs (PIP.COM, STAT.COM, QSORT.COM), and perhaps a few data files created by the Analyst system.

Data files can differ greatly in size. Some data files created by Analyst hold only a little information, say, instructions for a report format, extraction criteria, data file record structure, or sorting instructions (RPT, EXT, FIL, and SRT are the respective filetypes of these files). The data files of most concern are the ones you define for your own use (they can have any filetype, but DAT is recommended). These files can range in size from very small (1 or 2K) to very large (8,000K, or 8 "megabytes"), depending on the number of records they contain, and the record length defined for the file. The largest file allowed under CP/M is "8 megs". You'll notice that's way beyond the capacity of any "floppy" disk!

### HOW TO CALCULATE THE NUMBER OF RECORDS YOU CAN FIT ON A DISK

To find out how many data records will fit on a disk you need to know:

- (1) How much data (in kilobytes) can an empty disk hold?
- (2) Are there any other programs or data files on the disk, and if so, how much room do they take up?
- (3) What is the total length of a typical record on the file, in bytes?

You can easily find out how much one of your blank disks can hold with CP/M's STAT command (see Chapter 31). Put a blank, formatted disk on drive B, and a disk with STAT.COM on drive A. Press RESET, then type the command:

```
A>STAT B:
```

and press RETURN. The program should respond with the number of bytes (in "K") remaining on the B disk.

Let's say there were a few files already on the disk in B and we wanted to know how much room they took up. Again, you would use STAT, but this time give the command in the following form:

```
A>STAT B:*.*
```

which means "give me the size, in kilobytes, of all the files on B". Some versions of STAT tell you the size of each file and the amount of space remaining, which makes it easy. Otherwise, just subtract the total amount of space taken up by the files from the capacity of an empty disk to get the amount remaining.

To calculate the number of records that will fit in any amount of disk space all you need to know now is the length of the records on the file. Since all the records on an Analyst data file must be the same length, this is easy. You can get this information from the printout you made of your responses to the Define a Data File program, or by adding up the maximum length of each "data item" on the record, plus three (one for the "!" at the beginning of a data record and two for the carriage return/line feed

## Chapter 32: Calculating Disk Storage Space

combination that distinguishes the end of each record).

Now we can do the calculation. You may have already guessed how. Here is the formula:

$$\frac{\text{amount of space remaining in bytes}}{\text{length of typical record in bytes}} = \text{number of records}$$

Notice that the amount of space remaining (or available) must be expressed in "bytes", not "kilobytes". Here's an example: Let's say we have an empty 8" single density disk and want to know how many 175 byte records will fit on it. Just plug in the numbers and here's your answer, voila!:

$$\frac{240,000}{175} = 1,371 \text{ records (approximate)}$$

### WHEN SORTING A FILE DISK SPACE IS IMPORTANT

When you sort a data file it is important to know how large the file is, and how much room remains on disk. This is because sorting creates a new file (the sorted version) that is equal in size to the unsorted file. You can imagine what would happen if you tried to sort a file that occupied more than half a disk! The sorted version would not fit on disk with the unsorted version, and you'd get a DISK FULL error.

There are, of course, ways to avoid this situation. One way is to instruct the sorting program to create the sorted (or "output") version on a different disk than the disk that holds the unsorted (or "input") version. If you use SSG's QSORT you can order the sorted version to be created on a disk in a different disk drive, or on the same drive as the input file, but on a physically different diskette. In the latter case QSORT will prompt you to replace the disk that holds the unsorted file with another disk that has room for the sorted file.

There's one complication. Most sort programs, including QSORT, build temporary "workfiles" during the sorting process. You'll never see them (except under abnormal conditions), but they take up room on disk nonetheless. When you run Define Sort Parameters to set up the sort you have to state where you want them to be built. The combined size of the workfiles is about equal to the size of the input file. If the file to be sorted occupies over one-third of the disk, you should assign the workfiles to a different disk drive, if you want the output file (sorted version) to be created on the same disk (or disk drive) as the input file.

### DISK SPACE IS IMPORTANT FOR EXTRACTING TOO

Since "extracting" a data file (to create a subset of records or change the file specifications) causes a new file to be created, the same cautions expressed for sorting a file apply equally well, except you don't need to worry about workfiles. The extraction process does not use them.

### 33. The Why's and How's of Disk Back-Up

Caution and common sense dictate that whenever you purchase or receive computer software on floppy disk, you immediately copy it onto a fresh disk and store the original in a fire-proof, moisture-proof box to protect against inevitable human error and unpredictable system failure. With the original distribution disk tucked safely away from the ravages of dirt, grease, magnet, and mangle, you avoid the cost and inconvenience of unnecessary replacement. This warning applies doubly for disks containing data crucial to your operation. Do not make the mistake of being "penny wise and pound foolish"; the disk itself is almost always worth far less than the information residing on it.

#### WHEN TO MAKE BACK-UP COPIES

A back-up copy should be made of any disk containing data files after the data has undergone a major change, such as the addition or modification of a large number of records. A convenient rule of thumb is that data files should be backed up after you have entered (or changed) more records than you would care to enter again. Once per day is usually sufficient.

Disk back-up should also take place before any major processing step, such as a sort, extract, or squash operation. Having a copy of the data as it was before the processing occurred means you can start over if problems arise. It is far easier and less time consuming to start the processing over from scratch, than to try to recover from a serious processing error by other means.

If a serious processing error should occur, whether or not you have a recent backup, a backup copy should be made before you attempt any corrective action, such as editing the file. This makes it possible to return to the original problem if the error recovery procedure fails. Note that some errors (such as BDOS: BAD SECTOR errors) can make a disk unreadable, thus making it difficult, if not impossible, to make a backup copy. If you must use your back-up copy for error recovery, make a backup copy if it first (that is, make a back-up of the back-up).

#### FULL DISK BACK-UP WITH PIP

Although most computers come with their own full disk copy program which may be considerably faster, we'll explain how to make back-up copies of data disks with the PIP program that comes with CP/M, since it should be available to you.

You'll need a blank disk labelled BACK-UP that is properly formatted for your computer. You'll also need the disk that contains the data files you want to back up. This disk should hold the PIP.COM program, and should have had an operating system SYSGEN'ed on at some point since it will be placed in the A drive.

Because it is easier and safer to copy all the files on a disk than to copy only selected files, we'll explain that procedure. The instructions given here will work even if you've created your data files on the same disk as your Analyst programs.

## Chapter 33: The Why's and How's of Disk Back-Up

Place the disk to be copied on drive A and the BACK-UP disk on drive B. Press RESET or give the CTRL-C command, then type the command below:

```
A>PIP B:=A:*. *[v]
```

The PIP program will list all the files as it copies them. When copying is complete, the prompt returns. You may remove your disks. If you receive a VERIFY ERROR, the disk on B may be full. If not, the computer hardware may be at fault.

### FULL DISK BACK-UP WITH SDCOPY

A utility program named SDCOPY.COM that can be used to copy 8" single density IBM 3740 format disks (on standard CP/M systems) is distributed with Analyst. SDCOPY also verifies the copied data to make sure it is identical to the original.

To execute the program, type SDCOPY at the CP/M prompt, followed by RETURN. The program responds with the "log-on" and "mount" message shown below:

```
A>sdcopy
SDCOPY VER:2.0
PUT SOURCE ON A, DESTINATION ON B, THEN TYPE RETURN
```

The program is now stopped and either or both disks may be removed from their drives. The disk to be copied (the "source" disk) must be placed in drive A and the BACK-UP disk in drive B. The "destination" disk in drive B may be a blank, formatted disk, or any other disk. Any data or programs on the destination disk are destroyed and replaced with the contents of the source disk.

When both the source and destination disks have been inserted, press RETURN and the program begins to copy. When the copy is complete, you can repeat (if the repeat option was requested, see below), or give the command CTRL-C to end the program. After CTRL-C, put the disk that contains the SDCOPY program back in drive A (if it was removed), and press RETURN. The system will then be in the normal operating mode awaiting commands.

The SDCOPY program offers several options. Each option may be specified by typing a single character following the program name and separated by a least one space. If an "R" is typed, the copy program repeats. The program repeatedly displays the mount message (allowing both disks to be changed) until a CTRL-C is entered instead of the RETURN key. This allows several disks to be conveniently copied at one time. If an "S" is typed, the copy program stops copying at the first empty data "track". For partially full disks this option can speed up program execution. This option may only be used to copy source disks that have been "SYSGEN'ed". The example below shows a typical run of SDCOPY (user responses are in lower case):

## Chapter 33: The Why's and How's of Disk Back-Up

```
A>sdcopy rs1
SDCOPY VER:2.0
PUT SOURCE ON A, DESTINATION ON B, THEN TYPE RETURN [return]

SUCCESSFUL COPY
PUT SOURCE ON A, DESTINATION ON B, THEN TYPE RETURN [return]

SUCCESSFUL COPY
PUT SOURCE ON A, DESTINATION ON B, THEN TYPE RETURN [ctrl-c]

INSERT SYSTEM DISKETTE, THEN TYPE RETURN TO REBOOT [return]
A>
```

Because the access times of various manufacturer's disk controllers vary, data is spread around the revolving disks at varying distances. Consecutive items of data in a file may not necessarily occupy physically consecutive positions on the disk. This is termed "skewing". The SDCOPY program will run up to ten times faster if the skewing is properly set. Nine different skews are possible, and they are specified by typing a number from one to nine after the name SDCOPY (as in the example above). Trial and error is the best way to find the optimum skewing for each manufacturer's drives. If no skewing number is used, the SDCOPY program defaults to four.

Any combination of options may be specified for any run of SDCOPY. The characters may be in any order and need not be separated by spaces.

## 34. Error Messages

### Systemwide Messages

- RP001 THIS PROGRAM MUST BE RUN FROM THE MENU--Analyst is "menu-driven" which means you select the option desired from a menu. To call up the menu, type "AN" at the prompt.
- RP010 INVALID DRIVE LETTER--Valid entries are: @ or RETURN for the currently logged drive, and the letters A - Z in upper or lower case.

### System Menu (AN.SSG)

- RP101 SUBPROGRAM NOT FOUND: program name--The program is not on your disk; make sure all programs have been copied from the distribution disk.
- RP102 NOT NUMERIC--Your request for a menu function was not numeric, enter a number between 1 and 12.
- RP103 NOT ON MENU--Your request for a menu function, although numeric, was not a number between 1 and 6.
- RP104 INVALID DATE--Valid date entries are in either the MM/DD/YY or DD/MM/YY format (the latter only if ANPR1.101 has been modified, see Chapter 30). Include the slashes.
- RP105 INVALID RESPONSE--Valid responses are Y, yes, T, true, ok, N, no, F, or false.
- RP106 OUT OF RANGE
- RP107 MAIN PARAMETER FILE NOT FOUND; USING DEFAULTS: This message is issued at first time startup, or if the ANPR1.101 parameter file is not on the currently logged disk drive.
- RP108 UNEXPECTED EOF ON PARAMETER FILE; USING DEFAULTS--Something is wrong with your Parameter File (file name ANPR1.101). You should erase it and build a new one by calling up the menu. See Chapter 30.
- RP109 QSORT IS NOT ON THE CURRENTLY LOGGED DRIVE--The program QSORT.COM must be on the same disk as the Analyst programs.

## Chapter 34: Error Messages

- RP110 SORT PARAMETER FILE NOT FOUND--Run the DEFINE SORT PARAMETERS program. See Chapter 14.
- RP111 UNABLE TO CREATE SUBMIT FILE FOR SORT--The disk in drive A may be write-protected or full. Make sure the disk is write-enabled and that there is adequate space on the disk.
- RP112 UNABLE TO WRITE TO SUBMIT FILE--See RP111.
- RP113 INCORRECT LENGTH (1-8 CHARACTERS)
- RP114 INVALID CHARACTER(S) ENTERED--Invalid characters include period (.), question mark (?), asterisk (\*), and colon (:).

### Create Or Modify a Data File (ANDATENT.SSG)

- RP151 SQUASH PROGRAM NOT FOUND--Make sure the file named ANSQUASH.SSG is on your disk.
- RP152 NO SUCH FIELD--The program couldn't identify the access key you entered. Valid entries include the data file item number preceded immediately by a # (pound sign), or the descriptive name of the item (upper or lower case is acceptable).
- RP153 NOT NUMERIC--The # (pound sign) entry to the access key name request was not followed by a numeric value.
- RP154 LESS THAN ONE OR GREATER THAN NUMBER OF ITEMS--The data file item number you entered was not a valid number; check your FIL file specifications for the number of items on the data record.
- RP156 INVALID FUNCTION--Valid entries to the ENTER A FUNCTION request include a, c, d, e, s, adding, changing, deleting, examining, or examine (upper or lower case) only.
- RP157 INVALID FILE NAME--Invalid characters include period (.), blank, comma (,), colon (:), equal sign (=), semi-colon (;), asterisk (\*), question mark (?), quotation marks ("), left or right square brackets ([,]), and greater than/less than symbols (>,<). Also, the name given may have been longer than 8 characters, or a null (all blanks) entry (caused by hitting RETURN at the request).

## Chapter 34: Error Messages

- RP158 UNABLE TO READ HEADER AT OPEN--Your data file may contain invalid data. Or it may be a file created with Analyst version 1.0 that has not been converted to the Analyst 2.0 file format (see Chapter 29).
- RP159 INVALID CHARS ENTERED--Invalid entries include LINE FEED, CTRL-Z, CTRL-C, or quotation marks ("); re-enter without invalid characters.
- RP160 NOT NUMERIC--Your entry may have contained too many digits to the right or left of the decimal, or non-numeric characters.
- RP161 UNABLE TO OPEN DATA FILE--Make sure the correct disk is mounted.
- RP162 NOT NUMERIC--Your entry into a numeric field contained a non-numeric character.
- RP163 TOO LONG--Your entry into a numeric field contained too many digits.
- RP164 INVALID DATE--Your entry into a date field was not in the proper format (MM/DD/YY or DD/MM/YY), did not contain the right number of slashes, or contained invalid date values (e.g., 32 days in a month).
- RP165 UNABLE TO WRITE HEADER AT CREATE--Your disk may be write protected. See Chapter 3.
- RP166 UNEXPECTED EOF ON DATA FILE--READ--The number of records on the file may be less than the count stored in the header record. Bring your back-up files up to date, or change the header record to the correct value.
- RP167 INVALID RESPONSE--see RP105
- RP168 OUT OF RANGE--The relative record number you entered at the request for the access key or record number was less than 1 or greater than the number of records on the data file.
- RP169 FILE OUT OF ORDER. CAN'T ACCESS BY KEY--Sort your file on the item specified as the access key if you want to use this facility.
- RP170 RECORD NOT FOUND--Key in the proper record number or value. If deleted records are on the file, squash the file or try a different access method. You may have told the program the file was in sorted order when in fact it

## Chapter 34: Error Messages

is not; sort the file.

- RP171 RECORD LENGTH OF DATA FILE <> LENGTH IN FIL FILE: You may have put the wrong data file name in the File Definition File. The actual record length differs from the stated record length.
- RP172 UNABLE TO WRITE HEADER AT EOJ: Your disk may be write-protected. See Chapter 3.
- RP173 UNEXPECTED END OF DATA FILE--WRITE--You may have a full disk.
- RP174 TOO MANY DIGITS TO LEFT OF DECIMAL--Check the file specifications printout for the number of digits allowed.
- RP175 TOO MANY DIGITS TO RIGHT OF DECIMAL--See RP174.
- RP176 ALL DATA ITEMS IN THIS FILE HAVE BEEN SUPPRESSED--All the data item descriptions (in the FIL file) are blank. A blank description suppresses the data item request.

### Define A Data File (ANBLDFIL.SSG)

- RP251 INVALID CHARS ENTERED--see RP159.
- RP252 INVALID FILE NAME--see RP157.
- RP253 INVALID CHARS IN FILENAME--see RP157.
- RP254 UNEXPECTED EOF ON FIL FILE--Contact your distributor.
- RP255 INVALID CHARS IN DATA FILE NAME--See RP157.
- RP256 LENGTH INVALID--The length of the filename was greater than 8, or the length of the filetype was greater than 3.
- RP257 NULL NAME INVALID--Both the data filename and filetype were entered as null; either one or the other, but not both can be null.
- RP258 NOT NUMERIC--Invalid characters entered at the request for the number of data file items to be defined.
- RP259 OUT OF RANGE--Your entry to the request for the number of items to be defined was less than zero or greater than the maximum number allowed for the system (the maximum is 50,

## Chapter 34: Error Messages

unless the ANPR1.101 file is modified; see Chapter 30).

- RP260 TOO LONG--Your entry for the descriptive name of an item was longer than 30 characters.
- RP261 NOT NUMERIC--Your entry at the request for the maximum length of the item was not numeric.
- RP262 DATE FIELD MUST BE 6 LONG--maximum length for a date item must be 6 characters.
- RP263 NOT NUMERIC--Your entry contained non-numeric data.
- RP264 OUT OF RANGE--Your entry to the request for the type of data item was either less than zero or greater than the number of types available (1-4).
- RP265 NUMERIC FIELD HAS MIN LENGTH OF 6, MAX LENGTH OF 14. A numeric data item must be at least 6 digits (including the decimal).
- RP266 NOT NUMERIC--Invalid entry to the item type request; must be the type name (e.g., alpha) or the type number (e.g., 3).
- RP267 OUT OF RANGE--Your entry to the request for the item type was a number less than 1 or greater than the number of types (4).
- RP268 INVALID RESPONSE--see RP105
- RP269 YOU MAY NOT ENTER ^Z, QUOTE, OR LINE FEED--These are invalid entries.
- RP270 TOO LONG; MAXIMUM =
- RP271 NOT NUMERIC--Your entry contained non-numeric data.
- RP272 OUT OF RANGE--The record length may not be less than 3 or greater than the maximum of 255 (unless the ANPR1.101 file has been modified, see Chapter 30).
- RP273 INVALID DRIVE--Valid responses are @ or RETURN for the currently logged drive, or A through Z.
- RP274 NUMBER OF RIGHT DIGITS CANNOT EXCEED ITEM LENGTH--Two digits are required for the decimal point, and a zero to the left of the decimal ("0.").
- RP276 INTEGER FIELD HAS MAX LENGTH OF 12

## Chapter 34: Error Messages

- RP277 MAXIMUM RECORD LENGTH IS 255--Includes lead in character and carriage return/line feed at end of record. QSORT cannot sort records over 255 characters.
- RP278 THIS PROGRAM MUST BE RUN FROM THE MENU--See RP001.
- RP279 UNABLE TO READ FILE DEFINITION FILE--Your FIL file may contain invalid data, or could be a FIL file created with Analyst version 1.0 that has not been converted for use with Analyst version 2.0 (see Chapter 29).
- RP280 FIL, RPT, EXT, ASC, AND SRT ARE RESERVED FOR FILE TYPES--Enter a different filetype. DAT is suggested for data files, but not mandatory. See Chapter 6.

### Define A Report (ANRPENT.SSG)

- RP301 PROGRAM NOT FOUND: programname--see RP101
- RP302 INVALID FILE NAME--FIL file; see RP157.
- RP303 INVALID FILE NAME--RPT file; see RP157.
- RP304 INVALID RESPONSE--see RP105.
- RP305 NOT NUMERIC--Your request for a menu function was not numeric.
- RP306 NOT ON MENU--Your request for a menu function, although not numeric, was not a number between 1 and 6.

### Define A Report--Standard Parameters (ANRPENT2.SSG)

- RP341 INVALID CHARACTERS--see RP159.
- RP342 MUST RUN FROM MENU--See RP001.
- RP343 NOT NUMERIC--Your entry at the request for page width was not numeric.
- RP344 OUT OF RANGE--Your entry at the request for page width was less than the minimum (64) or greater than the maximum (199) entry.

## Chapter 34: Error Messages

- RP345 NOT NUMERIC--Your entry at the request for the number of lines to print per page was not numeric, or was out of the allowable range.
- RP346 OUT OF RANGE--Your entry at the request for the number of lines to print per page was numeric, but was out of the allowable range.
- RP347 NOT NUMERIC--Your response contained non-numeric data.
- RP348 OUT OF RANGE
- RP349 INVALID RESPONSE--see RP105.
- RP350 NOT NUMERIC--Your entry to the request for the date format was not recognizable (either MM/DD/YY or DD/MM/YY), or was not the number of the format type (either 1 or 2).
- RP351 OUT OF RANGE--Your entry to the request for the date format was numeric, but was greater than 2 or less than 1.

### Define A Report--Record Selection Criteria (ANRPENT3.SSG)

- RP381 INVALID CHARS--see RP159.
- RP382 MUST BE RUN FROM MENU--see RP001.
- RP384 NOT NUMERIC--Your entry for the request for the number of selection conditions was not numeric.
- RP385 OUT OF RANGE--The number of selection conditions you entered was less than zero or greater than the maximum allowed (10).
- RP386 NOT NUMERIC--Your entry for the number of the data file item to be selected on was not numeric.
- RP387 OUT OF RANGE--Your entry for the number of the data file item to be selected on was numeric but less than 1 or greater than the number of items on the data file.
- RP388 NOT NUMERIC--Your entry for the type of condition was unrecognizable or not within the range of valid types (1-4).
- RP389 OUT OF RANGE--The number of the condition type you entered

## Chapter 34: Error Messages

was less than 1 or greater than the number of types available (4).

- RP391 NULL RANGE--The LOW RANGE value you gave was null, probably as a result of hitting RETURN at the request for the low range value.
- RP392 NULL RANGE STRING INVALID--The HIGH RANGE value you gave was null, probably as a result of hitting RETURN at the request for the high range value.
- RP393 NOT NUMERIC--Valid entries at the request for the conjunction to the next condition include: OR, AND, XOR, O, A, X, 1, 2, or 3 (upper or lower case).
- RP394 OUT OF RANGE--Your entry for the type of conjunction was a number greater than the number of type available (2).

Define A Report--Detail Line Print Items, Horiz. Accums,  
and Headings (ANRPENT4.SSG)

- RP421 INVALID CHARS ENTERED--see RP159
- RP422 MUST RUN FROM MENU--see RP001.
- RP423 NOT NUMERIC OR INVALID NAME--Your entry was not numeric or was as invalid name.
- RP424 OUT OF RANGE--The number you entered was numeric, but less than 1 or greater than the maximum allowed.
- RP425 OUT OF RANGE--Your entry was less than 1 or greater than the maximum allowed.
- RP426 NOT NUMERIC--Your entry was not numeric.
- RP427 CAN'T OVERPRINT PREVIOUS ITEM OR BEYOND PAGE MARGIN--Make sure the column number you give does not overlap the last character of the previous item on the detail line or extend past the right margin.
- RP428 NOT NUMERIC OR INVALID NAME--Your entry for the type of detail line or lookahead item was not a recognizable item type name, or number.
- RP429 OUT OF RANGE--Your entry for the type of detail line or lookahead item was numeric, but less than 1 or greater

## Chapter 34: Error Messages

than the number of types available.

- RP430 TOO LONG--The literal you requested was longer than the maximum number of characters allowed for a literal (132).
- RP431 OUT OF RANGE. MAX = nn--where nn is the maximum.
- RP432 INCORRECT LENGTH
- RP433 INVALID ACCUMULATOR TYPE--Only allows horiz (H), cross-foot (X), level break (B), or summary (S).
- RP434 THERE AREN'T THAT MANY ACCUMULATORS OF TYPE: aaa-- where aaa is the accumulator type. The accumulator number you entered of this type has not yet been defined. The program will allow you to enter it if you confirm that you will create it later through the appropriate report definition module.
- RP435 TOO MANY RIGHT DIGITS--Horizontal accums are 14 digits maximum (minimum is 3), with up to 12 digits to the right of the decimal.
- RP436 MAXIMUM NUMBER OF ACCUMULATORS OF THIS TYPE IS nn-- where nn is the maximum allowed for this type of accumulator.
- RP437 INVALID RESPONSE--Type "S" to set the number of accumulators to be defined later at least as high as the accumulator number entered, or ESCAPE to enter a new number.
- RP438 TOO MANY LEFT DIGITS
- RP439 TOO MANY RIGHT DIGITS
- RP440 NOT NUMERIC OR INVALID FUNCTION--Only accepts 1 through 5 or +, -, \*, /, %.
- RP441 INPUT HORIZ. ACCUM. MUST HAVE NUMBER LOWER THAN: nn --You cannot use a higher numbered horizontal accumulator as input to a lower numbered accumulator.
- RP442 HORIZ ACCUMS CANNOT USE ALPHA OR DATE ITEMS AS INPUT--see Chapter 23.

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### Define A Report--Level Breaks, Cross Footing, and Accums (ANRPENT5.SSG)

- RP461 INVALID CHARS ENTERED--see RP159
- RP462 MUST RUN FROM MENU--see RPO01.
- RP463 NOT NUMERIC--Your entry for the number of level breaks was not numeric.
- RP464 OUT OF RANGE--Your entry for the number of level breaks was less than 1 or greater than the maximum allowed.
- RP465 NOT NUMERIC--The number you gave at the request for the data file item to be broken on was not numeric, nor a recognizable data item name.
- RP466 OUT OF RANGE--The number you gave at the request for the data file item to be broken on was numeric, but was less than -1 or greater than the number of items on the file.
- RP467 NOT NUMERIC--Your entry was not numeric.
- RP468 OUT OF RANGE--Your entry was numeric, but was less than zero or greater than the maximum number allowed.
- RP469 NOT NUMERIC--Your entry for the number of lines to leave blank before the total line was not numeric.
- RP470 OUT OF RANGE--Your entry for the number of lines to leave blank before the total line was numeric, but less than -1 or greater than the maximum allowed.
- RP471 NOT NUMERIC--Your entry for the number of lines to leave blank after the total line was not numeric.
- RP472 OUT OF RANGE--Your entry for the number of lines to leave blank after the total line was numeric, but less than -1 or greater than the maximum allowed (9).
- RP473 NOT NUMERIC OR INVALID NAME--Your entry for the number of the item to accumulate was not a recognizable descriptive name or the number of an existant data file item.
- RP474 OUT OF RANGE--Your entry for the number of the data file item to accumulate was numeric, but was less than 1 or greater than the number of data file items.
- RP475 NOT NUMERIC--Your entry for the type of accumulator was

## Chapter 34: Error Messages

not a recognizable type name (e.g., alpha), or a valid type number.

- RP476 OUT OF RANGE--Your entry for the type of accumulator was numeric, but less than 1 or greater than 8. Or, the number of digits to the right of the decimal for a horizontal accum is greater than the number allowed.
- RP477 NOT NUMERIC--Your entry was not numeric.
- RP478 OUT OF RANGE--Your entry for the break number on which to clear an accumulator was numeric, but less than zero or greater than the number of level breaks specified.
- RP479 NOT NUMERIC--Your entry for the column to begin printing an accumulator was not numeric.
- RP480 OUT OF RANGE--The column you gave to begin printing an accumulator was less than 1 or greater than the number of columns specified as the page width.
- RP481 TOO LONG--The data you entered for a literal accumulator was longer than the maximum number of characters allowed (132).
- RP482 NOT NUMERIC--Your entry was not numeric.
- RP483 OUT OF RANGE--Your entry was less than 1, or greater than the maximum allowed.
- RP484 INVALID LEAD-IN CHARACTER--The prefix "h", "x", "b", "s", or "i" must precede the accumulator or data item number (e.g., "h2", "b6", "i3", etc). "H" stands for horizontal accum, "X" for cross-foot accum, "B" for level break accum, "S" for summary accum, and "I" for data item. "I" can also be followed by a data item name (e.g., "inumber sold").
- RP485 INPUT XFOOT ACCUM # MUST BE LOWER THAN--You cannot input a higher numbered cross-foot accum into a lower numbered cross-foot accumulator, since they are computed in numerical order.
- RP486 OUT OF RANGE. MAX= nn-- Your entry was larger than the maximum allowed.
- RP487 THERE AREN'T THAT MANY ACCUMULATORS OF TYPE aaa--where aaa is the type of accumulator. If the type is summary, you must define at least as many summary accumulators for the summary extract; see Chapter 25.

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- RP488 INVALID ACCUMULATOR TYPE--Enter 1 for NUMERIC, 2 for INTEGER.
- RP489 XFOOT ACCUMS CANNOT USE LITERAL, DATE, OR ALPHA AS INPUT

### Define A Report--Report Titles (ANRPENT6.SSG)

- RP501 INVALID CHARS ENTERED--see RP159
- RP502 MUST RUN FROM MENU--see RP001.
- RP503 NOT NUMERIC--Your entry for the number of titles was not numeric.
- RP504 OUT OF RANGE--Your entry for the number of titles was greater than the maximum allowed.
- RP505 NOT NUMERIC--Your entry for the number of the column to print the title was not numeric.
- RP506 OUT OF RANGE--Your entry for the number of the column to print the title was larger than the number of columns specified for the page width.

### Print A Report (ANRPTPRN.SSG)

- RP541 RPT FILE NOT FOUND--The program can't find the report file you named. Make sure the file is on the disk in the DEFINITION FILE DRIVE (see Chapter 5). It is also possible that you misspelled the name.
- RP542 FIL FILE NOT FOUND--The program can't find the FIL file you named in your RPT file. Make sure it is on the disk in the DEFINITION FILE DRIVE (see Chapter 5). It might have been erased, renamed, or removed from the disk.
- RP543 DATA FILE NOT FOUND--The program can't find the data file you named in your FIL file. Make sure the data file is on the disk in the drive specified in the File Definition File. Check the Report Specifications printout.
- RP544 UNEXPECTED EOF ON RPT FILE--The Report Definition File may contain invalid data, or may have been defined under

## Chapter 34: Error Messages

Analyst version 1.0. Report definition files created with Analyst 1.0 cannot be used with Analyst 2.0.

- RP545 UNEXPECTED EOF ON FILE FILE--Contact your distributor.
- RP546 INVALID RPT FILE NAME--The name you gave was null, greater than 8 characters long, contained an imbedded blank, or a period, asterisk, question mark, colon, quotation mark or other invalid character.
- RP547 UNABLE TO READ DATA FILE HEADER RECORD--The data file may contain invalid data, or may be a file created with Analyst version 1.0 that has not yet been created to the Analyst 2.0 format.
- RP548 ATTEMPT MADE TO DIVIDE BY ZERO AT RECORD NUMBER--This is a warning. Analyst will not perform the calculation.

Remove Deleted Records From the Data File (ANSQUASH.SSG)

- RP571 MUST RUN FROM ANDATENT--The SQUASH program can only be run from the data entry program. The request to squash will be asked if you have deleted records from the file, or if the program has accessed a deleted record at any time during the current run. See Chapter 11 for how to force a SQUASH.
- RP572 UNABLE TO OPEN INPUT DATA FILE--Should not occur. Did you switch disks while Analyst was chaining to a new program?
- RP573 UNABLE TO CREATE OUTPUT DATA FILE--Your disk may be write-protected (see Chapter 3), or the disk directory full.
- RP574 INVALID DRIVE--Valid entries are @ (currently logged drive), or A through D. RETURN is the same as the input drive.
- RP575 UNABLE TO READ INPUT HEADERS--The data file may contain invalid data or may be a file created with Analyst version 1.0 that has not been converted to the 2.0 format (see Chapter 29).
- RP576 UNABLE TO WRITE HEADER AFTER CREATE--Your disk may be write-protected. See Chapter 3.
- RP577 UNABLE TO WRITE TO OUTPUT FILE--Make sure your disk is not

## Chapter 34: Error Messages

write protected, or that the disk is not full.

RP578 UNABLE TO WRITE HEADERS AT END--Should not occur.

### Define An Extract (ANEXTENT.SSG)

RP601 PROGRAM NOT FOUND: programname--see RP101.

RP602 INVALID FILE NAME--see RP157.

RP603 INVALID FILE NAME--see RP157.

RP604 INVALID RESPONSE--see RP105.

RP605 NOT NUMERIC--see RP305.

RP606 NOT ON MENU--Your request for a menu function, although numeric, was not between 1 and 5.

RP607 UNEXPECTED END OF FILE ON: filename--The input or output FIL file may not have been converted from the Analyst 1.0 format to 2.0 format.

RP608 UNEXPECTED END OF EXTRACT FILE

### Define An Extract--Link Input and Output Items and Accums (ANEXENT4.SSG)

RP621 INVALID CHARS ENTERED--see RP159.

RP622 MUST RUN FROM MENU--see RP001.

RP623 NOT NUMERIC OR INVALID NAME--Your entry was not numeric or an invalid name.

RP624 OUT OF RANGE--Your entry was less than 1 or greater than the number of data items on the input file.

RP625 OUT OF RANGE--Your entry was less than 1 or greater than the number of data items on the output file. Or, the accumulator function you requested was less than 1 or greater than 5.

RP626 NOT NUMERIC--Your entry was not numeric.

RP627 TYPE OF OUTPUT ITEM IS NEITHER NUMERIC NOR INTEGER--The output item must be numeric or integer.

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- RP628 NOT NUMERIC OR INVALID NAME
- RP629 OUT OF RANGE
- RP630 TOO LONG
- RP631 OUT OF RANGE. MAX =
- RP632 INCORRECT LENGTH
- RP633 INVALID ACCUMULATOR TYPE--Enter 1 for NUMERIC, 2 for INTEGER.
- RP634 THERE AREN'T THAT MANY ACCUMULATORS OF TYPE
- RP635 TRUNCATION OCCURS IF NUMERIC ITEM IS MOVED TO INTEGER ITEM--The output item is integer and the input item is numeric. This is a warning only.
- RP636 MAXIMUM NUMBER OF ACCUMULATORS OF THIS TYPE IS nn--Your entry was greater than the number of horizontal accums defined.
- RP637 INVALID RESPONSE-- Press ESCAPE or RETURN only.
- RP638 TOO MANY LEFT DIGITS
- RP639 TOO MANY RIGHT DIGITS
- RP640 NOT NUMERIC OR INVALID FUNCTION--Enter 1-5 or +, -, \*, /, %.
- RP641 INPUT HORIZ. ACCUM. MUST HAVE NUMBER LOWER THAN: nn--You cannot use a higher numbered horiz. accum as input to a lower number horiz. accum.
- RP642 CANNOT MOVE ALPHA ITEM TO NUMERIC OR INTEGER ITEM
- RP643 NUMERIC OR INTEGER ITEM WILL BE CONVERTED TO ALPHA ITEM--Warning Only.
- RP644 CANNOT MOVE ALPHA ITEM TO DATE ITEM
- RP645 DATE ITEM WILL BE CONVERTED TO NUMERIC OR INTEGER ITEM--Warning Only. Data in date item will be stored in YYMMDD form (e.g., 810327).
- RP646 CROSS FOOT ACCUMULATORS NOT ALLOWED FOR EXTRACT
- RP647 ACCUMULATORS CANNOT USE ALPHA OR DATE ITEMS AS INPUT

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RP648 CANNOT USE SUMMARY ACCUMULATORS AS INPUT FOR EXTRACT

Define An Extract--Summary Accumulators (ANEXENT6.SSG)

RP651 INVALID CHARS ENTERED--see RP159.

RP652 MUST RUN FROM MENU--see RPO01.

RP653 NOT NUMERIC OR INVALID NAME

RP654 OUT OF RANGE

RP655 NOT NUMERIC

RP656 OUT OF RANGE

RP657 CROSS FOOT ACCUMULATORS NOT ALLOWED FOR EXTRACT

RP658 NOT NUMERIC OR INVALID NAME

RP659 OUT OF RANGE

RP660 TOO LONG

RP661 OUT OF RANGE. MAX =

RP662 INCORRECT LENGTH

RP663 INVALID ACCUMULATOR TYPE--Enter 1 for NUMERIC, 2 for INTEGER.

RP664 THERE AREN'T THAT MANY ACCUMULATORS OF TYPE

RP665 TOO MANY RIGHT DIGITS

RP666 MAXIMUM NUMBER OF ACCUMULATORS OF THIS TYPE IS:

RP667 INVALID RESPONSE

RP668 TOO MANY LEFT DIGITS

RP669 TOO MANY RIGHT DIGITS

RP670 NOT NUMERIC OR INVALID FUNCTION-- Enter +, -, \*, /, or %, or 1 through 5, respectively.

RP671 CANNOT USE ANOTHER SUMMARY ACCUM AS INPUT

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- RP672 CANNOT MOVE DATE OR ALPHA ITEM TO NUMERIC OR INTEGER ACCUM  
RP673 ONLY OUTPUT DATA ITEMS MAY BE USED FOR SUMMARY  
ACCUMS--Summary accumulators can only total up data items  
on the output file. See Chapter 25.  
RP675 DATE ITEM WILL BE CONVERTED TO NUMERIC OR INTEGER--This is  
a warning only.

Define An Extract--Record Selection Criteria  
(ANEXENT3.SSG)

- RP681 INVALID CHARS--see RP159.  
RP682 MUST RUN FROM MENU--see RP001.  
RP684 NOT NUMERIC  
RP685 OUT OF RANGE  
RP686 NOT NUMERIC  
RP687 OUT OF RANGE  
RP688 NOT NUMERIC  
RP689 OUT OF RANGE  
RP690 NULL MATCH STRING INVALID  
RP691 NULL RANGE  
RP692 NULL RANGE STRING INVALID  
RP693 NOT NUMERIC  
RP694 OUT OF RANGE

Define An Extract--Print Extract File (ANEXENT7.SSG)

- RP701 INVALID CHARS ENTERED--see RP159.  
RP702 MUST RUN FROM MENU--see RP001.  
RP703 NOT NUMERIC  
RP704 OUT OF RANGE

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RP705 NOT NUMERIC

RP706 OUT OF RANGE

Define An Extraction--Level Breaks and Accums  
(ANEXENT5.SSG)

RP731 INVALID CHARS ENTERED--see RP159.

RP732 MUST RUN FROM MENU--see RPO01.

RP733 NOT NUMERIC

RP734 OUT OF RANGE

RP735 NOT NUMERIC OR INVALID DATA NAME

RP736 OUT OF RANGE

RP737 NOT NUMERIC

RP738 OUT OF RANGE

RP739 NOT NUMERIC

RP740 OUT OF RANGE

RP741 NOT NUMERIC

RP742 OUT OF RANGE

RP743 NOT NUMERIC OR INVALID DATA NAME

RP744 OUT OF RANGE

RP745 NOT NUMERIC

RP746 OUT OF RANGE

RP747 NOT NUMERIC

RP748 OUT OF RANGE

RP749 NOT NUMERIC

RP750 OUT OF RANGE

RP751 TOO LONG

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RP752 NOT NUMERIC  
RP753 OUT OF RANGE  
RP756 OUT OF RANGE. MAX =  
RP757 THERE AREN'T THAT MANY ACCUMULATORS OF TYPE  
RP758 INVALID ACCUMULATOR TYPE

### Extract (ANEXTRAK.SSG)

RP741 EXT FILE NOT FOUND  
RP742 FIL FILE NOT FOUND  
RP743 INPUT DATA FILE NOT FOUND  
RP744 UNEXPECTED EOF ON EXT FILE  
RP745 UNEXPECTED END OF FILE ON:  
RP746 INVALID FILE NAME  
RP747 UNABLE TO READ INPUT DATA FILE HEADER RECORD--Your data file may contain invalid data, or may have been created with Analyst version 1.0, but not converted to the Analyst 2.0 file format (see Chapter 29).  
RP748 ATTEMPT MADE TO DIVIDE BY ZERO AT RECORD NUMBER --The calculation will not be performed.  
RP750 INVALID RESPONSE  
RP751 UNABLE TO WRITE OUTPUT FILE HEADERS--Your disk may be write-protected.  
RP752 UNABLE TO WRITE TO OUTPUT FILE--see RP751.  
RP753 TRUNCATION OCCURRED AT RECORD NUMBER: nn

### Define Sort Parameters (ANSRTPRM.SSG)

RP801 MUST RUN FROM MENU--see RPO01.  
RP802 FILE DEFINITION FILE NOT FOUND  
RP803 TOO LONG

## Chapter 34: Error Messages

- RP804 INVALID CHARACTERS
- RP805 UNABLE TO OPEN FILE DEFINITION FILE--Make sure the correct disk is mounted and is not write-protected or full.
- RP806 UNABLE TO READ FILE DEFINITION FILE--see RP805.
- RP807 UNABLE TO CREATE OR OPEN SORT PARAMETER FILE--see RP805.
- RP808 UNABLE TO READ OR WRITE SORT PARAMETER FILE--see RP805.
- RP809 NOT NUMERIC OR INVALID NAME
- RP810 NOT NUMERIC
- RP811 OUT OF RANGE
- RP812 INVALID RESPONSE
- RP813 THAT TAKES YOU BEYOND THE END OF THE ITEM--This is a warning only. The length you entered extends into the next data item on the record.

### Convert Data File Format (ANCONVRT.SSG)

- RP901 OUT OF RANGE
- RP902 INVALID FILE NAME
- RP903 INVALID FILE NAME
- RP904 INVALID RESPONSE
- RP905 NOT NUMERIC
- RP906 NOT ON MENU
- RP907 THE FILE DEFINITION FILE IS NOT A VERSION 1.0 FILE
- RP908 UNABLE TO WRITE NEW FILE DEFINITION FILE--Your disk may be write-protected or full.
- RP909 INPUT DATA FILE NOT FOUND
- RP910 UNABLE TO OPEN INPUT DATA FILE--You may have inserted the wrong disk or have the wrong FIL file.
- RP911 UNABLE TO OPEN NEW DATA FILE--see RP910.

## Chapter 34: Error Messages

- RP912 UNABLE TO WRITE NEW DATA FILE HEADER--Your disk may be write-protected or full.
- RP913 UNABLE TO WRITE TO NEW DATA FILE--see RP 912.
- RP914 ONE CHARACTER STRIPPED FROM RIGHT OF DATA ITEM #nn--The output data item is shorter than the input data item, so characters are stripped from the right of the input data to make it fit.
- RP915 INPUT DATA FILE IS TOO LONG; UNABLE TO CONTINUE--The maximum record length allowed is 255 characters (including the CR/LF characters at the end of each record). The maximum length of an ALPHA (string) field is 132. The program strips characters from the right of string fields until it arrives at these lengths. If the records are still too long, the program stops.
- RP916 'NONE' IS AN INVALID FORMAT
- RP917 INVALID HEADER ITEM TYPE--acceptable values are "R" for record counter, "I" for integer, "A" for ALPHA or DATE strings, and "N" for real numbers. They must be separated by commas, and specified in the order they stand on the header record: e.g., "r,i,n,a".
- RP918 THERE CANNOT BE MORE THAN 1 RECORD COUNTER
- RP919 UNABLE TO READ INPUT FILE HEADER--You may be processing a file created under Analyst version 1.0.
- RP920 TRUNCATION OCCURRED IN RECORD NUMBER--This is a warning only. A data item had a field length that was longer than specified in the FIL file, so 1 or more chars were stripped when it was written to the AN file.
- RP921 FILE DEFINITION FILE NOT FOUND--You may have inserted the wrong disk, or the file may contain invalid data.

### Enquiry (ANQUERY.SSG)

- RP931 INVALID CHARACTERS
- RP932 THIS PROGRAM MUST BE RUN FROM MENU
- RP933 FILE DEFINITION FILE NOT FOUND

## Chapter 34: Error Messages

- RP934 NOT NUMERIC
- RP935 OUT OF RANGE
- RP936 NOT NUMERIC
- RP937 OUT OF RANGE
- RP938 NOT NUMERIC
- RP939 OUT OF RANGE
- RP940 NULL MATCH STRING INVALID
- RP941 NULL RANGE
- RP942 NULL RANGE STRING INVALID
- RP943 NOT NUMERIC
- RP944 OUT OF RANGE
- RP945 DATA FILE NOT FOUND
- RP946 UNEXPECTED END OF FILE ON FIL FILE--The file may contain invalid data or may have been created with Analyst version 1.0, but not yet converted (see Chapter 29).
- RP947 UNABLE TO READ DATA FILE HEADER RECORD--The data file may have been created with Analyst version 1.0, but not yet converted to the new file format (see Chapter 29).
- Change Default Parameters on ANPR1.101 File (ANDEFALT.SSG)
- RP971 INVALID CHARS ENTERED
- RP972 MUST RUN FROM MENU
- RP973 THE MAXIMUMS GIVEN MAY RESULT IN AN OUT-OF-MEMORY ERROR DURING DATA ENTRY AND/OR WRITING REPORTS--You can increase the maximum values of some data items under certain circumstances (additional RAM available, or when certain maximums have actually been decreased). However, an OM error may be issued by the run-time interpreter program when the maximums are increased beyond an acceptable point.
- RP974 OUT OF RANGE (1-200 ARE ACCEPTABLE)--However, this may cause an OM (Out of Memory) error at a later point.

## Chapter 34: Error Messages

RP975 NOT NUMERIC

## 35. Command Summary

ESCAPE: Ends current function or program (follow with RETURN).

RETURN: Enters new value or command and advances to next request; accepts default or current value.

UP ARROW (^): Goes back to previous request or set of requests.

BACKSPACE: Backs up cursor to erase miskey or erroneous response.

At ENTER A FUNCTION Request:

A	Add one record
ADDING	Add more than one record
C	Change one record
CHANGING	Change more than one record
E	Examine one record
EXAMINE	Examine more than one record
S	Save additions or changes to disk
D	Delete one record
DELETING	Delete more than one record

At RECORD KEY (OR #n) Request: Type a value in the "access key field" (e.g., "Jones, John J."), or "#n" (e.g., "#22") to locate records for modification, deletion, or examination.

TO CALL UP THE ANALYST SYSTEM MENU: Type "AN" at the CP/M prompt character:

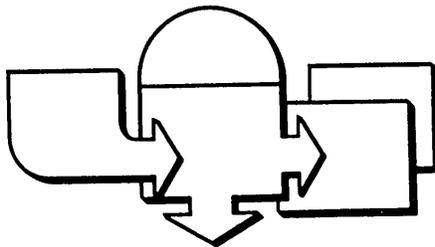
A>AN [followed by RETURN]



# **ANALYST**

## **Demonstration Instructions/User Guide**

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INCORPORATED

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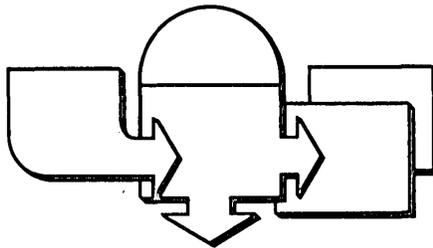
These Demonstration Instructions take you step by step through ANALYST and guide you in creating the report shown on page 3.

This Report was built in 2 stages. When you reach the end of STAGE I and print the report make sure it looks like STAGE I of the Report. The stages build on one another -- do not attempt to skip any step.

Follow all instructions carefully. After duplicating the sample report you will understand how to set up ANALYST to perform similiar functions.

NOTE: This Report was designed very carefully on a printer spacing chart (available from Moore Business Forms) BEFORE the operator keyed in these specifications. See pages 21 and 47 for a drawing of the spacing charts used to design this report.

These Demonstration Instructions are not a replacement for the Reference Manual. Refer to this guide for instructions on running ANALYST.







## CHECK THESE FEATURES

1. ANALYST allows you to define the structure of the RECORDS in the manila folders. With this RECORD structure you build FILES containing various ITEMS of information. Once the records contain the ITEM information you specify you can run a Report Definition program and build a report showing the information you desire in the order you desire.
2. You can perform math across columns and down rows. Math can be performed on the items of information in your files, on sub-totals, and grand totals.
3. Up to 10 different total lines are possible for subtotals or running totals (e.g. amount sold, item price, total sales, etc.)
4. Up to 10 different calculation are allowed and a constant value may be specified.
5. Your reports can be given Titles. Titles appear at the top of the report.
6. Look Ahead titles label the data to follow. They make the report easier to read and more informative.
7. Each page of the report shows the date and page number. Files can be compressed to print as mailing labels or simple forms.
8. SSG's QSORT program can arrange your files in up to 4 different sorted orders. (This Sample Report is sorted by name in alphabetic order.)

Sample of Analyst Report

1. ITEMS of Information							2. Calculations		7. Date and Page Number	
NAME	PRODUCT	# SOLD	DATE	UNIT PRICE	% COMM.	TOTAL SALE	TOTAL COMM.			
STRUCTURED SYSTEMS GROUP, INC. Sample of Analyst										
5. Titles										
SALES FOR:										
Allen Abrahms	executive desk	2	06/28/81	600.00	6.00	1,200.00	72.00			
Allen Abrahms	File Cabinets	8	06/28/81	128.00	6.00	1,024.00	61.44			
Allen Abrahms	File Cabinets	2	06/28/81	128.00	6.00	256.00	15.36			
Allen Abrahms	30 x 72 walnut desk	5	06/29/81	405.00	6.00	2,025.00	121.50			
						4,505.00	270.30			
3. Total Lines										
SALES FOR:										
Brad Brownstone	30 x 72 walnut desk	1	06/26/81	405.00	7.00	405.00	28.35			
						405.00	28.35			
6. LookAhead Titles										
SALES FOR:										
Carol Crenshaw	File Cabinets	3	06/27/81	128.00	6.00	384.00	23.04			
Carol Crenshaw	Conference Table	3	06/27/81	500.00	6.00	1,500.00	90.00			
						1,884.00	113.04			
8. Sorting										
SALES FOR:										
Debbie Davies	stack chairs	50	06/27/81	35.00	6.00	1,750.00	105.00			
Debbie Davies	stack chairs	60	06/28/81	35.00	6.00	2,100.00	126.00			
Debbie Davies	30 x 72 walnut desk	6	06/28/81	405.00	6.00	2,430.00	145.80			
Debbie Davies	30 x 72 walnut desk	2	06/28/81	405.00	6.00	810.00	48.60			
						7,090.00	425.40			
4. Up to 10 different Calculations										
SALES FOR:										
Edward Eckoff	drawer organizer files	18	06/28/81	12.75	7.00	229.50	16.07			
Edward Eckoff	File Cabinets	8	06/28/81	128.00	7.00	1,024.00	71.68			
						1,253.50	87.75			
GRAND TOTALS						15,137.50	924.84			

(Figure 1.2: Features of the ANALYST Report)

## 2. Basic Rules

FOLLOW ALL INSTRUCTIONS CAREFULLY

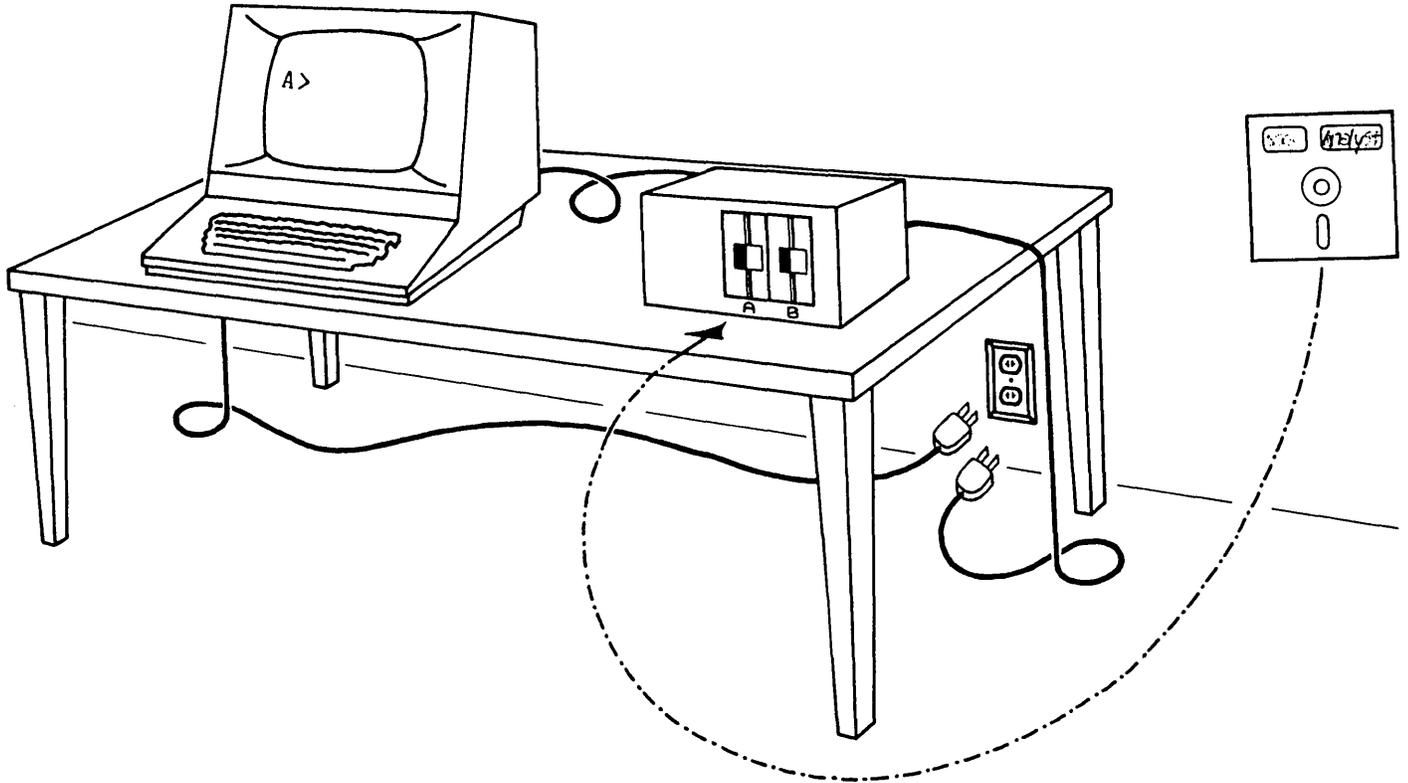
Computers are VERY literal

1. Handle your disks with care. Do not touch the exposed magnetic material and do not let them come in contact with magnetic forces. Keep the disks in their jackets when not in use.
2. NEVER pull the disks out of the disk drives unless the CP/M prompt is showing. Failure to comply may result in damage to your data.
3. Generally you must hit the RETURN key after typing each response. The RETURN key tells the computer you are ready to continue.
4. Make sure to copy (BACK-UP) your disks regularly. This protects them against damage. We describe copying with PIP because PIP comes with the CP/M operating system (which means you should ALREADY have it). BACK-UP (Copying Disks) is explained in Chapter 5.
5. Generally, to end a program you either press the ESCAPE key or type the word "stop".
6. Be patient while the computer processes your response. It may take several seconds.
7. Don't be afraid of the computer. If you follow the steps in this guide you will have no problem running the ANALYST system.
8. Don't be afraid to ask your supervisor questions -- no one was born knowing how to run computers.

\* FOR THIS SAMPLE YOU ARE TO ENTER THE DATA THAT IS UNDERLINED. \*

### 3. Set-Up

Getting SET-UP is as easy as 1,2,3!!!



(Figure 3.1: The Computer Set-Up)

1. Make sure your terminal, computer, disk drives, and printer are plugged in. (Make sure your disk drives and printer are plugged into your computer).
2. Make sure that 132 column paper is properly aligned in the printer, and the top of form is set.
3. Turn on your terminal, computer, disk drives and printer.
4. Insert the ANALYST Program Disk into a disk drive. (The direction the disk label faces depends on your equipment).
5. Press the RESET button on the computer.

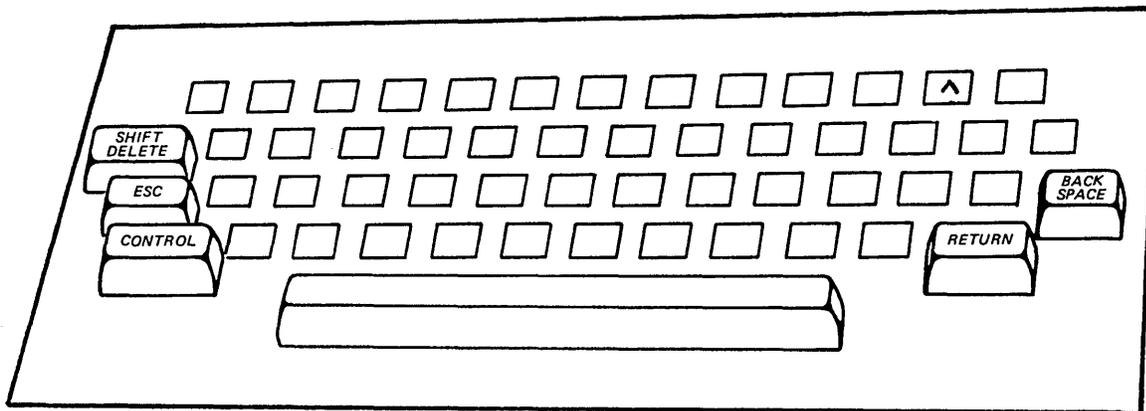
A "prompt" (usually A>) should appear. The prompt indicates that the computer is ready to operate. If a prompt doesn't appear make sure there is an Operating System on the disk.

The CRT has a cursor (usually an illuminated square or triangle; video devices vary) which indicates the next position where the data you enter will be placed.

You are now prepared to begin. The next page is a directory of SPECIAL FUNCTION KEYS.

## 4. The Keyboard (Special Function Keys)

Please Note:  
(Keyboards DO vary)



(Figure 4.1: The Keyboard (Special Function Keys))

The keys on the terminal are similar to the keys on a typewriter.

The major difference is that some terminal keys can perform special functions.

The RETURN key is VERY IMPORTANT! It causes the computer to read your response and prepares the computer for the next request. HIT THE RETURN KEY AFTER TYPING EACH RESPONSE. Hitting RETURN will also leave the current answer intact.

The CONTROL key is also IMPORTANT. Control keys (used in conjunction with other other keys) perform special functions. The CONTROL key is used like a SHIFT key. You press it at the same time you press a letter key.

i.e., When instructed to give the command CTRL-A, press the CONTROL key and the A key at the same time.

The BACKSPACE key erases the last character entered (on most machines). Some computers use the DELETE key instead (sometimes SHIFT-DELETE).

The ESCAPE key often enables you to end the current function. Use only when indicated.

## HOW TO USE THE SYSTEM

These demonstration instructions provide you with the information needed to build the Sample ANALYST Report. When you are instructed to ENTER some information, just type in the underlined response.

You must hit RETURN after typing a response to instruct the computer to process your response.

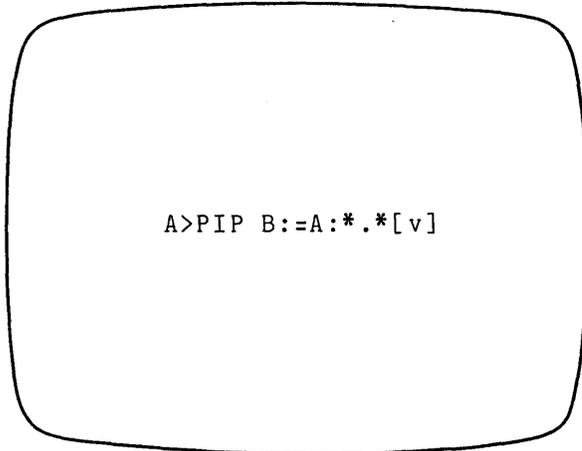
When instructed to enter a CONTROL COMMAND you are to press the CONTROL key and the letter key simultaneously. For example, you might be asked to give the command CTRL-A. The CONTROL key is like a typewriter SHIFT key. You press it at the same time you press the letter key.

When requested to ENTER DATE you are to enter the date in the form of MM/DD/YY. For example, 7/15/81. Include the slashes.

## 5. Back-Up (Copying Disks)

To protect the data you have entered into the ANALYST system it is IMPORTANT that you BACK-UP (copy) your disks. People are human and computers are machines (which means they are liable to err). COPYING DISKS will save you time and money.

Although you can use any method, the PIP program is explained here because PIP comes with CP/M. To use PIP as explained here, your data disk should be in drive A and a blank disk in drive B. The FORMULA is:



and translated means:

"COPY onto the B disk all the files on the A disk[and verify]"

(Figure 5.1: Back-Up -- Copying Disks with PIP)

BACK-UP your disks often. Because disks contain valuable information you should make back-up copies and store them in a safe dry place.

When instructed to "BACK-UP" your disks, refer to this chapter.

## 6. Calling up the ANALYST Menu

All functions are run by selecting them from the ANALYST menu.

Call up the menu by typing AN.

Example.....

The screen will display.....

and inform you.....

The screen will display.....  
and request you to.....

Enter the current date in numbers in the form of 7/15/81. Include the slashes.

The Analyst System Menu will appear:

```
A>AN
COPYRIGHT INFORMATION
CHECKING FILE STATUS, PLEASE WAIT
READING PARAMETER FILE

CURRENT VALUE: 00/00/00
ENTER SYSTEM DATE (MM/DD/YY)
```

```
***** A N A L Y S T *****

ANALYST SYSTEM MENU

1 DEFINE A DATA FILE          2 CREATE OR MODIFY A DATA FILE
3 DEFINE A REPORT              4 PRINT A REPORT
5 DEFINE AN EXTRACTION        6 EXTRACT
7 DEFINE SORT PARAMETERS      8 SORT DATA FILE
9 ENQUIRY                     10 CONVERT DATA FILE FORMAT
11 NEW DEFINITION FILES       12 CHANGE SYSTEM DATE
CR REFRESH MENU              ESC END PROGRAM

ENTER NUMBER OF FUNCTION DESIRED:
```

(Figure 6.1: Calling up the Analyst System Menu)

Enter Number 1 (DEFINE A DATA FILE). Note that defining and creating a data file are NOT the same. Before you can build your ANALYST Report you must DEFINE THE DATA FILE. Follow the instructions on the following pages.

## 7. Define a Data File

Select #1 (DEFINE A DATA FILE) from the ANALYST SYSTEM MENU.

The screen requests.....

Enter Sample.

The screen informs you.....

Enter Y (for yes).

The screen informs you.....

Enter Sample.Dat. The last name (.dat) appears on your disk directory. It is given a last name to distinguish it from other types of files.

```
ENTER NAME OF FILE DEFINITION FILE Sample

FILE DEFINITION FILE NOT FOUND
CREATE ONE? (Y OR N) Y

NAME OF DATA FILE DEFINED (nnnnnnnn.ttt)
CURRENT VALUE: FILE1.DAT
NEW VALUE: Sample.Dat
```

The screen requests.....

Hit RETURN to create the data file on the same drive with the programs. You may enter another drive reference.

The screen requests.....

Enter Sample of Analyst.

```
DATA FILE DRIVE
CURRENT VALUE: e
NEW VALUE:

DESCRIPTION OF DATA FILE (30 CHARS)
CURRENT VALUE: DATA FILE
NEW VALUE: Sample of Analyst
```

The screen requests.....

Enter 6. This is the number of items each record will contain.

- i.e.:
1. NAME
  2. PRODUCT
  3. NUMBER SOLD
  4. DATE
  5. UNIT PRICE
  6. COMMISSION RATE

```
NUMBER OF DEFINED ITEMS PER RECORD.
CURRENT VALUE: 1
NEW VALUE: 6
```

7. Define A Data File: ITEMS

For each item (6 in this sample) you will be requested to enter the information as shown below. We put a question mark at the end of the requests so that when you CREATE your data file the requests will be issued in the form of a question.

ITEM NUMBER ONE:

The screen displays.....

Enter Name? (Include the question mark).

```
--ITEM NUMBER: 1
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 1 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE:  FIELD
NEW VALUE:      Name?
```

The screen displays.....

Enter 3 (Alpha) as the new value. An explanation of Item Types may be found on the last page of this manual.

The screen displays.....

Enter 20 as the new value. This will allow you to enter up to 20 characters for the name.

```
ITEM TYPE (1=NUMERIC;2=INTEGER;3=ALPHA;4=DATE)
CURRENT VALUE:  Integer
NEW VALUE:      3
```

```
MAXIMUM LENGTH OF DATA ITEM
CURRENT VALUE:  1
NEW VALUE:      20
```

7. Define A Data File: ITEMS

ITEM NUMBER TWO:

The screen displays.....

```
--ITEM NUMBER: 2
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 21 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE:      FIELD
NEW VALUE:          Product?
```

Enter Product? (Include question mark).

The screen displays.....

```
ITEM TYPE (1=NUMERIC;2=INTEGER;3=ALPHA;4=DATE)
CURRENT VALUE:      Integer
NEW VALUE:          3
```

Enter 3 (Alpha) as the new value.

The screen displays.....

Enter 25 as the new value. This will allow you to enter up to 25 characters for the name of the product.

```
MAXIMUM LENGTH OF DATA ITEM
CURRENT VALUE:      1
NEW VALUE:          25
```

7. Define A Data File: ITEMS

ITEM NUMBER THREE:

The screen displays.....

```
--ITEM NUMBER: 3
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 46 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE:      FIELD
NEW VALUE:          Number Sold?
```

Enter Number Sold? (Include the question mark).

The screen displays.....

```
ITEM TYPE (1=NUMERIC;2=INTEGER;3=ALPHA;4=DATE)
CURRENT VALUE:      Integer
NEW VALUE:          2
```

Hit RETURN to use the default (2). Integers are whole numbers without decimal points.

The screen displays.....

```
MAXIMUM LENGTH OF DATA ITEM
CURRENT VALUE:      1
NEW VALUE:          3
```

Enter 3 as the new value. This will allow you to enter up to 3 characters for the number sold.

7. Define A Data File: ITEMS

ITEM NUMBER FOUR:

The screen displays.....

```
--ITEM NUMBER: 4
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 49 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE:  FIELD
NEW VALUE:      Date?
```

Enter Date? (Include the question mark).

The screen displays.....

```
ITEM TYPE (1=NUMERIC;2=INTEGER;3=ALPHA;4=DATE)
CURRENT VALUE:      4
NEW VALUE:          4
```

Enter 4 (for date) as the new value. The program will NOT ask you for the maximum length because all dates must conform to the 00/00/00 format.

7. Define A Data File: ITEMS

ITEM NUMBER FIVE:

The screen displays.....

```
--ITEM NUMBER: 5
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 55 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE: FIELD
NEW VALUE: Unit Price?
```

Enter Unit Price? Include the question mark.

The screen displays.....

```
ITEM TYPE (1=NUMERIC; 2=INTEGER; 3=ALPHA; 4=DATE)
CURRENT VALUE: Integer
NEW VALUE: 1
```

Enter 1 (for numeric) as the new value. Numeric values accept decimal points.

The screen displays.....

```
MAXIMUM LENGTH OF DATA ITEM
CURRENT VALUE: 1
NEW VALUE: 9
```

Enter 9 as the new value. (You would want 14 for larger values).

The screen displays.....

```
NUMBER OF DIGITS TO RIGHT OF THE DECIMAL?
CURRENT VALUE: 2
NEW VALUE: 2
```

Enter 2,

7. Define A Data File: ITEMS

ITEM NUMBER SIX:

The screen displays.....

Enter Commission Rate? (Include the question mark).

```
--ITEM NUMBER: 6
THIS ITEM DEFINES DATA ON THE FILE THAT
BEGINS WITH POSITION 64 (INCLUSIVE)

DESCRIPTIVE NAME OF ITEM
CURRENT VALUE:   FIELD
NEW VALUE: Commission Rate?
```

The screen displays.....

Enter 1 (for numeric) as the new value. This will allow you to calculate commissions with decimals if desired.

The screen displays.....

Enter 6 as the new value.

```
ITEM TYPE (1=NUMERIC;2=INTEGER;3=ALPHA;4=DATE)
CURRENT VALUE:   Integer
NEW VALUE:       1
```

The screen displays.....

Enter 2.

Since you have defined all 6 records, The program displays the request.....

```
MAXIMUM LENGTH OF DATA ITEM
CURRENT VALUE:   1
NEW VALUE:       6
```

```
NUMBER OF DIGITS TO RIGHT OF THE DECIMAL
CURRENT VALUE:   2
NEW VALUE:       2
```

```
HIT ESCAPE TO WRITE RECORD, OR
RETURN TO MAKE CHANGES
```

Hit ESCAPE to end the program.

If you made any mistakes or wish to re-read the input you can hit RETURN and scroll through the requests. You can change information by entering a new value.

7. Define A Data File: ITEMS

The screen will inform you.....

THE TOTAL COMBINED LENGTH OF ALL THE DATA FIELDS  
ON THE FILE IS 69.

THREE BYTES ARE ADDED TO THE RECORD LENGTH  
TO ACCOUNT FOR THE LEAD-IN CHARACTER AND FOR  
THE RETURN LINE-FEED AT THE END OF THE RECORD.  
THE ACTUAL RECORD LENGTH IS NOW 72.

DO YOU WISH A HARD-COPY OF THE  
FILE SPECIFICATIONS (Y OR N) Y

The screen requests.....

Enter Y (for Yes).

The screen displays the request.....

ENSURE THAT PRINTER IS ON, AND HIT RETURN.

Make sure that your printer is on and  
is properly aligned with 132 column paper.

\*\*\*\*\* SAVE THE FILE SPECIFICATIONS! \*\*\*\*\*

You will need them to Define A Report.

The screen informs you.....

STOP REQUESTED

ANBLDFIL COMPLETE

The menu returns automatically.

You are now ready to build the  
file you defined. See next page.

## 8. Create or Modify a Data File

Select #2 (CREATE OR MODIFY A DATA FILE)

The screen displays.....

The program assumes you want to create the data file you just defined.

The screen informs you.....

Enter Y (for yes).

The screen requests.....

Hit RETURN (your file is not yet sorted).

The screen requests.....

Enter the word Adding.

The ENTER A FUNCTION request allows you to:

ADD one record	-- enter A
ADD more than one record	-- enter ADDING
CHANGE one record	-- enter C
CHANGE more than one record	-- enter CHANGING
EXAMINE one record	-- enter E
EXAMINE more than one record	-- enter EXAMINING
DELETE one record	-- enter D
SAVE additions	-- enter S

The screen displays.....

The at-sign (@) repeats the contents from the previous record.

The screen requests.....

Enter Allen Abrahms for NAME  
Enter executive desk for PRODUCT.  
Enter 2 for NUMBER SOLD.  
Enter 6/28/81 for DATE.  
Enter 600 for UNIT PRICE.  
Enter 6 for COMMISSION RATE.

```
DATA FILE NAME: SAMPLE.DAT
DATA FILE DESCRIPTION: Sample of Analyst
```

```
DATA FILE NOT FOUND
CREATE ONE? (Y OR N) Y
```

```
ENTER ACCESS KEY FIELD (RETURN IF UNSORTED)
```

```
ENTER A FUNCTION (A,C,D,E,S,ESC TO STOP) Adding
```

```
-- RECORD # 1
  ENTER @ TO DUPLICATE
  VALUE ENTERED IN LAST RECORD.
```

```
NAME?
PRODUCT?
NUMBER SOLD?
DATE?
UNIT PRICE?
COMMISSION RATE?
```

8. Create or Modify a Data File

The screen displays.....

Hit ESCAPE to WRITE the record to disk and to begin adding the next record. If you made any mistakes, hit RETURN to scroll through the sequence and make corrections.

The screen displays.....

and displays the requests as shown above. Enter the information in the following chart until you have added 13 records.

HIT ESCAPE TO WRITE RECORD,  
OR RETURN TO MAKE CHANGES

-- RECORD # 2  
ENTER @ TO DUPLICATE VALUE  
ENTERED IN LAST RECORD

REMEMBER to hit ESCAPE to write the record to the disk. If you hit RETURN the sequence of questions will scroll through again. If you're not careful you will type over information.

#	NAME?	PRODUCT?	# SOLD?	DATE?	UNIT PR?	COMM R.
2	Brad Brownstone	30 X 72 walnut desk	1	6/26/81	405	7
3	Carol Crenshaw	Conference Table	3	6/27/81	500	6
4	@ (at sign)	File Cabinets	3	@	128	@
5	Debbie Davies	stack chairs	50	6/27/81	35	6
6	Edward Eckoff	File Cabinets	18	6/28/81	128	7
7	@ (at sign)	drawer organizer files	18	@	12.75	@
8	Allen Abrahms	30 X 72 walnut desk	5	6/29/81	405	6
9	@	File Cabinets	8	6/28/81	128	@
10	@	@	2	@	@	@
11	Debbie Davies	30 X 72 walnut desk	6	6/28/81	405	6
12	@	@	2	@	@	@
13	@	stack chairs	60	@	35	@

Notice that you entered at signs (@). The at sign (@) duplicates information from the previous record (i.e. Carol Crenshaw made the 3rd sale as well as the 2nd so an at sign (@) is entered for NAME).

When finished making these entries, hit ESCAPE at the NEW VALUE request for RECORD NUMBER #14.

## 8. Create or Modify a Data File

The screen will display.....

ENTER A FUNCTION  
(A,C,D,E,S, ESC TO STOP)

Hit ESCAPE to return to the menu.

If you made any mistakes, enter the word CHANGING and hit return until the information you desire to change is displayed. Hit ESCAPE to examine the next record.

If you want to ensure that all entries are correct, enter the word EXAMINE at the ENTER A FUNCTION request. Hit RETURN to examine the first record. Hit ESCAPE to begin examining the second, etc.

After you've entered above information correctly you are ready to DEFINE A REPORT. Select #3 from the ANALYST menu.

```
***** A N A L Y S T *****  
R E P O R T   D E F I N I T I O N   M E N U  
  
FILE DEFINITION FILE: SAMPLE.FIL  
REPORT DEFINITION FILE: SAMPLE.RPT  
  
1 STANDARD PARAMETERS           2 REPORT TITLES  
3 DETAIL LINE PRINT ITEMS,      4 LEVEL BREAKS, CROSS-  
  HORIZ. ACCUMS AND HEADINGS    FOOTING, AND ACCUMULATORS  
5 RECORD SELECTION CRITERIA     6 PRINT REPORT DEFINITIONS  
CR REFRESH MENU                 ESC STOP PROGRAM (RETURN to menu)  
  
ENTER NUMBER OF FUNCTION DESIRED
```



## 9. Define a Report

To DEFINE A REPORT select #3 from the menu.

The program requests.....

Enter Sample.

The screen displays the request.....

Enter Y (for yes).

The screen displays the request.....

Enter Sample.

The Report Definition Menu will appear:

```
ENTER NAME OF REPORT DEFINITION FILE Sample

REPORT FILE NOT FOUND
CREATE ONE? (Y OR N) Y

NAME OF FILE DEFINITION FILE
CURRENT VALUE:      DEFINE
NEW VALUE:         Sample
```

```
***** A N A L Y S T *****
REPORT DEFINITION MENU

FILE DEFINITION FILE: SAMPLE.FIL
REPORT DEFINITION FILE: SAMPLE.RPT

1 STANDARD PARAMETERS                2 REPORT TITLES
3 DETAIL LINE PRINT ITEMS,          4 LEVEL BREAKS, CROSS-
  HORIZ. ACCUMS AND HEADINGS        FOOTING, AND ACCUMULATORS
5 RECORD SELECTION CRITERIA        6 PRINT REPORT DEFINITIONS
CR REFRESH MENU                    ESC STOP PROGRAM (RETURN to menu)

ENTER NUMBER OF FUNCTION DESIRED
```

(Figure 9.2: Report Definition Menu)

REPORT TITLES

Note: The Sample Report was created with STANDARD PARAMETERS. Standard Parameters are the most common responses: 132 columns, 60 lines per page, MM/DD/YY date format, and YES, print hardcopy.

To give your Report Titles, select #2 from the Define a Report menu. (Report Titles are the names at the top of the report).

The screen displays the request.....

Enter 12.

```
NUMBER OF TITLES
CURRENT VALUE:    2
NEW VALUE:       12
```

Because you requested 12 Titles, you must inform the program where to place them. Titles appear at the top of the report (spaces between Titles and Items are considered Titles).

For each Title, the screen displays the following requests:

-----  
TITLE NUMBER 1

Hit RETURN to leave the 1st Title set at 0 ( 0 is centered).

Hit RETURN to leave the Title of STRUCTURED SYSTEMS GROUP, INC.

```
-----
-- TITLE NUMBER: 1
TITLE COLUMN POSITION (0=CENTERED)
CURRENT VALUE:    0
NEW VALUE:

TITLE
CURRENT VALUE: STRUCTURED SYSTEMS GROUP, INC.
NEW VALUE:
```

9. Define a Report: REPORT TITLES

-----  
TITLE NUMBER 2

Hit RETURN to leave the  
2nd Title set at 0.

Enter Sample of Analyst  
for the 2nd Title.

-- TITLE NUMBER: 2  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE:  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: Sample of Analyst

-----  
TITLE NUMBER 3

Hit RETURN to leave the  
3rd Title set at 0.  
set at 0.

Hit RETURN to leave the  
3rd Title as a blank line.

-- TITLE NUMBER: 3  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE:  
  
TITLE  
CURRENT VALUE: 0  
NEW VALUE:

-----  
TITLE NUMBER 4

Enter 9 as the position where  
the 4th Title is to begin.

Enter NAME as the 4th Title.

-- TITLE NUMBER: 4  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 9  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: NAME

9. Define a Report: REPORT TITLES

-----  
TITLE NUMBER 5

Enter 29 as the position where  
the 5th Title is to begin.

Enter PRODUCT as the 5th Title.

-- TITLE NUMBER: 5  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 29

TITLE  
CURRENT VALUE:  
NEW VALUE: PRODUCT

-----  
TITLE NUMBER 6

Enter 47 as the position where  
the 6th Title is to begin.

Enter # SOLD as 6th Title.

-- TITLE NUMBER: 6  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 47

TITLE  
CURRENT VALUE:  
NEW VALUE: # SOLD

-----  
TITLE NUMBER 7

Enter 57 as the position where  
the 7th Title is to begin.

Enter DATE as the 7th Title.

-- TITLE NUMBER: 7  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 57

TITLE  
CURRENT VALUE:  
NEW VALUE: DATE

9. Define a Report: REPORT TITLES

-----  
TITLE NUMBER 8

Enter 70 as the position where  
the 8th Title is to begin.

Enter UNIT PRICE as the 8th Title.

--- TITLE NUMBER: 8  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 70  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: UNIT PRICE

-----  
TITLE NUMBER 9

Enter 83 as the position where  
the 9th Title is to begin.

Enter % COMM. (for percent of  
commission) as the 9th Title.

--- TITLE NUMBER: 9  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 83  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: % COMM.

-----  
TITLE NUMBER 10

Enter 97 as the position where  
the 10th Title is to begin.

Enter TOTAL SALE as the name of  
the 10th Title.

--- TITLE NUMBER: 10  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 97  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: TOTAL SALE

9. Define a Report: REPORT TITLES

-----  
TITLE NUMBER 11

Enter 115 as the position where  
the 11th Title is to begin.

Enter TOTAL COMM. as the name of  
the 11th Title.

-- TITLE NUMBER: 11  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE: 115  
  
TITLE  
CURRENT VALUE:  
NEW VALUE: TOTAL COMM.

-----  
TITLE NUMBER 12

Hit RETURN to leave set at zero.

Hit RETURN to insert a blank line  
between the Titles and the Data.

-- TITLE NUMBER: 12  
TITLE COLUMN POSITION (0=CENTERED)  
CURRENT VALUE: 0  
NEW VALUE:  
  
TITLE  
CURRENT VALUE: 0  
NEW VALUE:

-----  
-----  
After adding the 12 Titles,  
the program requests you to.....

Hit ESCAPE to end the Title Naming portion  
of the DEFINE A REPORT function.

HIT ESC TO EXIT THIS MODULE,  
OR RETURN TO MAKE MORE CHANGES

If you made any mistakes while entering Titles,  
hit RETURN to scroll through the Titles and re-  
enter any incorrect data.

The DEFINE A REPORT menu appears automatically.

PRINT ELEMENTS

Select #3 (DETAIL LINE PRINT ITEMS, HORIZ. ACCUMS, AND HEADINGS) from the Define a Report Menu.

In the last chapter you defined the Titles for the report. In this chapter you will define the positions of the items to be put under the Titles.

The screen displays the option.....

Hit RETURN to leave set at zero. LOOKAHEAD Items allow you to merge data records. The file must be sorted. SORTING and LOOKAHEAD TITLES are used in STAGE 2.

```

NUMBER OF LOOKAHEAD TITLES
CURRENT VALUE:      0
NEW VALUE:

NUMBER OF DETAIL LINES PER DATA RECORD
CURRENT VALUE:      1
NEW VALUE:

```

The screen displays the option.....

Hit RETURN for 1 DETAIL LINE. (Level Breaks are not detail lines.)

```

DETAIL LINE NUMBER: 1
NUMBER OF PRINT ELEMENTS FOR THIS DETAIL LINE
CURRENT VALUE:      0
NEW VALUE:          8

NUMBER OF LINES TO SKIP BETWEEN DATA RECORDS
(0-9)
CURRENT VALUE:      0
NEW VALUE:          0

```

The screen displays the option.....

Enter 8 as you have 6 data items plus 2 additional items for each data record.

The screen displays the question.....

Enter 0.

```

TOTAL NUMBER OF HORIZONTAL ACCUMULATORS
CURRENT VALUE:      0
NEW VALUE:          2

```

The screen displays the question.....

Enter 2. Horizontal accumulators are the calculations that are made within the records. NOTE that the Report has 2 totals (accumulators) on the first line (Items 7 and 8).

PRINT ELEMENTS

For each Print Element (you entered 8 above) the screen displays the following requests for information to be entered.

An explanation of the ELEMENT TYPES is on the last page.

-----  
PRINT ELEMENT #1.

-- DETAIL LINE NUMBER: 1  
-- PRINT ELEMENT NUMBER: 1  
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=ACCUM)  
CURRENT VALUE: ALL RECS  
NEW VALUE: 6

Enter 6 (for Alpha).

DATA FILE ITEM NAME/NUMBER  
CURRENT VALUE: NONE  
NEW VALUE: NAME

Enter NAME.

PRINT IN COLUMN NUMBER  
CURRENT VALUE:  
NEW VALUE: 2

Enter 2 (to begin printing  
the name in column 2).  
-----

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #2.

```
-- DETAIL LINE NUMBER: 1
-- PRINT ELEMENT NUMBER: 2

ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=ACCUM)
CURRENT VALUE: ALL RECS
NEW VALUE: 6
```

Enter 6 (for Alpha).

Enter PRODUCT as the name  
of the item.

```
DATA FILE ITEM NAME/NUMBER
CURRENT VALUE: NONE
NEW VALUE: PRODUCT
```

```
PRINT IN COLUMN NUMBER
CURRENT VALUE: 22
NEW VALUE: 23
```

Enter 23 (to begin printing  
the product in column 23).

---

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #3.

Enter 5 (for integer).

-- DETAIL LINE NUMBER: 1  
-- PRINT ELEMENT NUMBER: 3  
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM  
5=INT;6=ALPHA;7=DATE;8=ACCUM)  
CURRENT VALUE: ALL RECS  
NEW VALUE: 5

Enter NUMBER SOLD as the  
name of the item.

DATA FILE ITEM NAME/NUMBER  
CURRENT VALUE: NONE  
NEW VALUE: NUMBER SOLD  
  
PRINT IN COLUMN NUMBER  
CURRENT VALUE: 48  
NEW VALUE: 49

Enter 49 (to begin printing  
the Number Sold in column 49).

---

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #4

```
-- DETAIL LINE NUMBER: 1
-- PRINT ELEMENT NUMBER: 4
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=ACCUM)
CURRENT VALUE: ALL RECS
NEW VALUE: 7
```

Enter 7 (for Date).

Enter Date as the name  
of the item.

```
DATA FILE ITEM NAME/NUMBER
CURRENT VALUE: NONE
NEW VALUE: DATE

PRINT IN COLUMN NUMBER
CURRENT VALUE: 52
NEW VALUE: 56
```

Enter 56 (to begin printing  
the Date in column 56).

---

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #5

-- DETAIL LINE NUMBER: 1  
-- PRINT ELEMENT NUMBER: 5  
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=ACCUM)  
CURRENT VALUE: ALL RECS  
NEW VALUE: 4

Enter 4 (for numeric).

Enter UNIT PRICE as the  
name of the data item.

DATA FILE ITEM NAME/NUMBER  
CURRENT VALUE: NONE  
NEW VALUE: UNIT PRICE

PRINT IN COLUMN NUMBER  
CURRENT VALUE: 64  
NEW VALUE: 68

Enter 68 (to begin print the  
Unit Price is column 68).

---

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #6

Enter 4 (for Numeric).

```
-- DETAIL LINE NUMBER: 1
-- PRINT ELEMENT NUMBER: 6
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=ACCUM)
CURRENT VALUE: ALL RECS
NEW VALUE: 4
```

Enter COMMISSION RATE as  
the name of the data item.

```
DATA FILE ITEM NAME/NUMBER
CURRENT VALUE: NONE
NEW VALUE: COMMISSION RATE

PRINT IN COLUMN NUMBER
CURRENT VALUE: 78
NEW VALUE: 83
```

Enter 83 (to begin printing the  
Commission Rate in column 83).

---

9. Define a Report: PRINT ELEMENTS

---

PRINT ELEMENT #7

-- DETAIL LINE NUMBER: 1  
-- PRINT ELEMENT NUMBER: 7  
ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=ACCUM)  
CURRENT VALUE: ALL RECS  
NEW VALUE: 8

Enter 8 (for accumulator). As Accumulators perform functions on other items, the following requests will be issued:

NUMBER OF HORIZONTAL ACCUMULATOR  
FOR THIS PRINT ELEMENT  
CURRENT VALUE: NONE  
NEW VALUE: 1

Enter 1 to indicate that this is the first accumulator on the 1st line.

LENGTH OF HORIZONTAL ACCUMULATOR (3-14)  
CURRENT VALUE: 14  
NEW VALUE: 12

Enter 12 to indicate that the contents of this accumulator will consume up to 12 spaces.

PRINT IN COLUMN NUMBER  
CURRENT VALUE: 7  
NEW VALUE: 91

Enter 91 (to begin printing the accumulator in column 91).

---

9. Define a Report: PRINT ELEMENTS

ACCUMULATOR REQUEST....

-----  
PRINT ELEMENT #8

Enter 8 (for accumulator).

```
-- DETAIL LINE NUMBER: 1
-- PRINT ELEMENT NUMBER: 8

ELEMENT TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=ACCUM)
CURRENT VALUE: ALL RECS
NEW VALUE: 8

NUMBER OF HORIZONTAL ACCUMULATOR
FOR THIS PRINT ELEMENT
CURRENT VALUE: NONE
NEW VALUE: 2
```

Enter 2 to indicate that this is  
the 2<sup>nd</sup> horizontal accumulator  
on the 1st line.

```
LENGTH OF HORIZONTAL ACCUMULATOR (3-14)
CURRENT VALUE: 14
NEW VALUE: 8

PRINT IN COLUMN NUMBER
CURRENT VALUE: 8
NEW VALUE: 114
```

Enter 114 (to begin printing  
the accumulator in column 108).

-----  
After you've entered information for the  
elements, the screen displays the request..

```
HIT ESCAPE TO EXIT THIS SECTION
OR RETURN TO MAKE MORE CHANGES
```

Hit ESCAPE to end this section.  
The next section explains how  
to enter information for  
accumulators.

## ACCUMULATORS

When you define accumulators you enter the input which determines which print elements are calculated.

For each accumulator (you requested two in the above section) the screen displays the following requests.

The screen displays the request.....

```
--HORIZONTAL ACCUMULATOR NUMBER:      1
HORIZONTAL ACCUMULATOR FUNCTION ( + - * / % )
CURRENT VALUE:      +
NEW VALUE:          *
```

Enter an asterisk (\*) to indicate that the 1st accumulator is to be multiplied.

The accumulator functions allow you to:

```
+    add
-    subtract
*    multiply
/    divide
%    calculate percentages
```

The screen displays the request.....

```
HORIZONTAL ACCUMULATOR TYPE (1=NUM,2=INT)
CURRENT VALUE:      1
NEW VALUE:          1
```

Enter 1 to indicate that the 1st accumulator total is a numeric value (includes decimals).

As you entered the above value as numeric, the screen displays the request...

```
NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT
CURRENT VALUE:      2
NEW VALUE:          2
```

Hit RETURN for the default (2).

The screen displays and requests.....

```
INPUT NUMBER:      1
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE:      0
NEW VALUE:          I3
```

Enter I3 (NOT 13).

I for ITEM.  
3 for NUMBER SOLD.

9. Define A Report: ACCUMULATORS

The screen displays and requests.....

```
INPUT NUMBER: 2
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE: 0
NEW VALUE: 15
```

Enter 15 (NOT 15).  
1 for ITEM  
5 for UNIT PRICE

The screen displays and requests.....

```
INPUT NUMBER: 3
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE: 0
NEW VALUE: 0
```

Enter 0 as there are only 2 items  
for this accumulator. There can be  
up to 5 items per accumulator. Hit  
RETURN to scroll through the requests  
until ACCUMULATOR NUMBER: 2.

For accumulator #2,

The screen displays requests.....

```
-- HORIZONTAL ACCUMULATOR NUMBER: 2
HORIZONTAL ACCUMULATOR FUNCTION (+ - * / %)
CURRENT VALUE: +
NEW VALUE: *
```

Enter an asterisk (\*) as you are multiplying  
a percentage (Commission Rate) by a numeric  
value.

The screen displays the request.....

```
HORIZONTAL ACCUMULATOR TYPE (1=NUM,2=INT)
CURRENT VALUE:
NEW VALUE: 1
```

Enter 1 to indicate that the first accumulator  
total is a numeric value (includes decimals).

9. Define A Report: ACCUMULATORS

As you entered the above value as numeric, the screen displays the request..

Enter 2.

The screen displays and requests.....

Enter I6 (NOT 16).  
I for ITEM  
6 for COMMISSION RATE

```
NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT
CURRENT VALUE: 2
NEW VALUE: 2

INPUT NUMBER: 1
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE: 0
NEW VALUE: I6
```

The screen displays and requests.....

Enter H1 to indicate that Horizontal Accumulator #1 -- Total Sale -- is the 2nd input for Accumulator #2.

```
INPUT NUMBER: 2
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE: 0
NEW VALUE: H1
```

The screen displays and requests.....

Enter 0 as there are only 2 items for this accumulator. There can be up to 5 items per accumulator. Hit RETURN to scroll through the requests UNTIL:

```
INPUT NUMBER: 3
TYPE OF INPUT: DATA ITEM
TYPE AND NUMBER OF INPUT (H#=HOR,S#=SUM,
B#=BRK,X#=XFT,I#=ITM,O=NONE)
CURRENT VALUE: 0
NEW VALUE: 0
```

9. Define A Report: ACCUMULATORS

The last request.....

Enter 0.01 to indicate that this accumulator is a percentage and is to be multiplied by 0.01.

The screen displays the request.....

Hit ESCAPE to end this section.

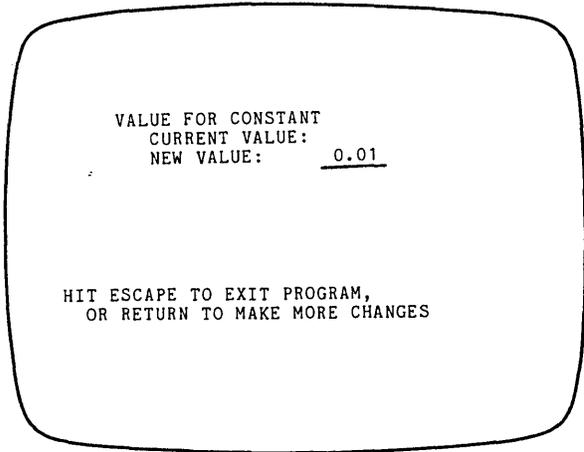
If you made any mistakes you can hit RETURN to scroll through the requests and re-enter any incorrect information.

The Report Definition File menu returns automatically.

Select #6 (PRINT REPORT DEFINITIONS) from the Report Definition Menu. (Make sure printer is on and the paper is aligned.)

Hit ESCAPE to return to the main menu.

Now you are ready to print STAGE I of your Report. See next page.



## **10. Print a Report**

Select #4 PRINT A REPORT from the main menu.

Ensure that your printer is on and 132 column paper is aligned.

Your Report should appear as shown on the next page.

Sample of Analyst Report -- STAGE I.

STRUCTURED SYSTEMS GROUP, INC.  
Sample of Analyst

PAGE 1  
DATE 07/15/81

NAME	PRODUCT	# SOLD	DATE	UNIT PRICE	% COMM.	TOTAL SALE	TOTAL COMM.
Allen Abrahms	executive desk	2	06/28/81	600.00	6.00	1,200.00	72.00
Brad Brownstone	30 x 72 walnut desk	1	06/26/81	405.00	7.00	405.00	28.35
Carol Crenshaw	Conference Table	3	06/27/81	500.00	6.00	1,500.00	90.00
Carol Crenshaw	File Cabinets	3	06/27/81	128.00	6.00	384.00	23.04
Debbie Davies	stack chairs	50	06/27/81	35.00	6.00	1,750.00	105.00
Edward Eckoff	File Cabinets	8	06/28/81	128.00	7.00	1,024.00	71.68
Edward Eckoff	drawer organizer files	18	06/28/81	12.75	7.00	229.50	16.07
Allen Abrahms	30 x 72 walnut desk	5	06/29/81	405.00	6.00	2,025.00	121.50
Allen Abrahms	File Cabinets	8	06/28/81	128.00	6.00	1,024.00	61.44
Allen Abrahms	File Cabinets	2	06/28/81	128.00	6.00	256.00	15.36
Debbie Davies	30 x 72 walnut desk	6	06/28/81	405.00	6.00	2,430.00	145.80
Debbie Davies	30 x 72 walnut desk	2	06/28/81	405.00	6.00	810.00	48.60
Debbie Davies	stack chairs	60	06/28/81	35.00	6.00	2,100.00	126.00

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(Figure 10.1: Sample of Analyst Report -- STAGE I.)

IF IT DOESN'T LOOK LIKE THIS YOU DID SOMETHING WRONG. GO BACK TO CHAPTER 9 TO DEFINE THE REPORT. MAKE SURE YOU ENTERED ALL INFORMATION CORRECTLY.

\*\*\* BACK-UP (COPY) YOUR DISKS. Refer to Chapter 5. \*\*\*

Even if the Report doesn't look like its supposed to, BACK-UP (COPY) your disks. Corrective action will be much easier.

STAGE II.

## 11. Sorting

ANALYST files can be sorted in any order (i.e. name, product, date, numeric, etc.). This Sample is sorted by name.

To use LEVEL BREAKS (for sub-totals) and LOOK AHEAD TITLES (prints all like names together in alphabetical order) the file must be SORTED. Use the SSG QSORT program.

Select #7 DEFINE SORT PARAMETERS from the menu.

The screen displays the request.....

Enter Sample.

The screen displays the information.....

Enter Y (for Yes).

The screen displays the request.....

Enter Sample.

```
NAME OF SORT PARAMETER FILE
CURRENT VALUE:  NONE
NEW VALUE:      Sample

SORT PARAMETER FILE NOT FOUND
CREATE ONE? (Y OR N)  Y

ENTER NAME OF FILE DEFINITION FILE Sample
```

The screen displays the request.....

Hit RETURN to create the Sort Parameter File on the same drive with the programs.

The screen displays the request.....

Enter Sample.

The screen displays the request.....

Enter DAT.

```
OUTPUT FILE DRIVE (A-Z, RET=SAME AS INPUT FILE)
CURRENT VALUE:  @
NEW VALUE:

NAME OF OUTPUT FILE
CURRENT VALUE:
NEW VALUE:      Sample

FILE TYPE OF OUTPUT FILE
CURRENT VALUE:  NONE
NEW VALUE:      DAT
```

11. SORTING: Define Sort Parameters #7

The screen displays the request.....  
Enter Y (for Yes).

```
BACK UP THE OUTPUT FILE? (Y OR N)
CURRENT VALUE:  YES
NEW VALUE:      Y
```

The screen displays the option.....  
Enter N (for No).

```
IF YOU ELECT TO CHANGE DISKS, THEN THE OUTPUT FILE
MUST BE ON A DIFFERET DISK THAN THE WORK FILES.
CHANGE DISKS FOR WRITING OUTPUT FILE? (Y OR N) N
```

The screen displays the option.....  
Hit RETURN (for No).

```
PRINT SORT STATISTICS ON CONSOLE? (Y OR N)
CURRENT VALUE:  NO
NEW VALUE:      N
```

The screen displays the request.....  
Hit RETURN to create the temporary  
work files on the same drive as the  
programs.

```
TEMPORARY WORK FILE DRIVE
(A-Z,RET=SAME AS INPUT FILE)
CURRENT VALUE:
NEW VALUE:
```

The screen displays the information and request.  
Enter NAME as the item to sort on.

```
SORT KEY NUMBER:  2
INPUT FILE ITEM NAME/NUMBER (0=END)
CURRENT VALUE:    NONE
NEW VALUE:        NAME
```

The screen displays the request.....  
Hit RETURN (for yes) to sort the  
entire file by name.

```
DO YOU WISH TO SORT ON ENTIRE ITEM?
(Y OR N;RET=Y)
```

11. SORTING: Define Sort Parameters #7

The screen displays the request.....

Enter A (for ascending) to sort from A-Z.

The screen displays the request.....

Enter A (for alphabetic).

```
ASCENDING OR DESCENDING ORDER (A OR D)
CURRENT VALUE:
NEW VALUE:   A

ALPHABETIC OR NUMERIC SORT? (A OR N)
CURRENT VALUE:
NEW VALUE:   A
```

The screen displays the information and request.

Hit ESCAPE to end.  
(You can enter up to 5 items to sort on).

```
SORT KEY NUMBER: 3
INPUT FILE ITEM NAME/NUMBER
CURRENT VALUE:
NEW VALUE:
```

The screen displays the request.....

Hit ESCAPE to end.

The screen displays the request.....  
Enter Y (for Yes).

```
HIT ESCAPE TO EXIT THIS SECTION,
OR RETURN TO CONTINUE

DO YOU WANT A HARDCOPY OF THE SORT
PARAMETERS? (Y OR N)
```

\*\*\* BE SURE YOUR PRINTER IS ON AND 132 COLUMN PAPER IS ALIGNED \*\*\*

The Report Definition menu appears automatically.

Now that you've Defined Sort Parameters you want to SORT the DATA FILE. See next page.

SORT DATA FILE (Menu function #8)

Select #8 from the ANALYST menu. (Be sure you've Defined Sort Parameters.)

The screen displays the request.....

```
NAME OF SORT PARAMETER FILE
CURRENT VALUE:  A: SAMPLE
NEW VALUE:      Sample
```

Hit RETURN.

(The program assumed you want to sort the file you just defined.)

The screen displays the information.....

```
it works exiting gracefully
A:QSORT A:SAMPLE
VER: 1.5
SORT COMPLETED
```

Sorting is done internally.

The menu returns automatically.

## 12. Define a Report STAGE II.

This is a replication of the spacing chart used to design STAGE II of this report.  
The values entered in STAGE I are still in use.

INSTRUCTION FOLLOW PRINTED RULE SPACING

STRUCTURED SYSTEMS GROUP SAMPLE OF ANALYST							
NAME	PRODUCT	# SOLD	DATE	UNIT PRICE	% COMM.	TOTAL SALE	TOTAL COMM.
Allen Abrams	executive desk	2	7/15/81	600	51		

Print Element #1	Print Element #2, etc.	Horizontal Accum. #1	Horizontal Accum. #2
------------------	------------------------	----------------------	----------------------

Title #1	Title #2	Title #3	Title #4-11
Title #12			

FORM

(Figure 12.1: Replication of Spacing Chart -- STAGE II)

### 13. Level Breaks

Select #3 (DEFINE A REPORT) from the ANALYST menu.

Select #4 LEVEL BREAKS, CROSS-FOOTING, AND ACCUMULATORS from the Report Definition Menu.

The screen displays the requests:

Enter 4 to indicate that there are 4 level breaks. (The ----- lines are considered level breaks).

Enter NAME to indicate that a level break should occur when the NAME changes.

```
-----  
NUMBER OF LEVEL BREAKS  
CURRENT VALUE:      0  
NEW VALUE:          4  
  
-- LEVEL BREAK NUMBER:      1  
BREAK ON DATA FILE ITEM NAME/NUMBER  
(-1=ALL RECS; 0=END OF FILE)  
CURRENT VALUE:      EOF  
NEW VALUE:          NAME
```

Enter 2 to indicate that the 1st level break consists of 2 items (totals).

Enter 0 to indicate there are no cross-foot accumulators (this means the total will come from vertical information (above)).

```
HOW MANY TOTALS TO PRINT  
CURRENT VALUE:  
NEW VALUE:          2  
  
HOW MANY CROSS-FOOT ACCUMULATORS  
CURRENT VALUE:  
NEW VALUE:          0
```

13. Define a Report: LEVEL BREAKS

Enter 0.

HOW MANY LINES TO SKIP BEFORE TOTALS  
(0-9;-1=NEW PAGE)  
CURRENT VALUE:  
NEW VALUE: 0

Enter 0.

HOW MANY LINES TO SKIP AFTER TOTALS  
(0-9;-1=NEW PAGE)  
CURRENT VALUE:  
NEW VALUE: 0

Enter 3 (for LITERAL).

-- ACCUMULATOR NUMBER: 1. 1 OF 2 THIS BREAK.

ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)  
CURRENT VALUE:  
NEW VALUE: 3

Enter 14 dashes (-----).

ENTER LITERAL DATA  
CURRENT VALUE:  
NEW VALUE: -----  
LITERAL LENGTH IS: 14

Enter 92 as the number of the column  
where the dashes (-----) are  
to begin.

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE:  
NEW VALUE: 92

13. Define a Report: LEVEL BREAKS

Enter 3 (for LITERAL).

```
-- ACCUMULATOR NUMBER: 1. 2 OF 2 THIS BREAK.  
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)  
CURRENT VALUE:  
NEW VALUE:      3
```

Enter 14 dashes (-----).

```
ENTER LITERAL DATA  
CURRENT VALUE:  
NEW VALUE:      -----  
LITERAL LENGTH IS: 14  
  
WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 107  
NEW VALUE:      112
```

Enter 112 as the number of the column where the slashes are to begin.

13. Define a Report: LEVEL BREAKS

Enter NAME to indicate that a level break should occur when the NAME changes.

Enter 2 to indicate that Level Break #2 consists of 2 items (totals).

```
-- LEVEL BREAK NUMBER:      2  
  
BREAK ON DATA FILE ITEM NAME/NUMBER  
(-1=ALL RECS; 0=END OF FILE)  
CURRENT VALUE:             EOF  
NEW VALUE:                 NAME
```

```
HOW MANY TOTALS TO PRINT  
CURRENT VALUE:  
NEW VALUE:                 2
```

Enter 0 to indicate there are no cross-foot accumulators (this means the total will come from vertical information (above)).

Enter 0.

```
HOW MANY CROSS-FOOT ACCUMULATORS  
CURRENT VALUE:  
NEW VALUE:                 0
```

```
HOW MANY LINES TO SKIP BEFORE TOTALS  
(0-9; -1=NEW PAGE)  
CURRENT VALUE:  
NEW VALUE:                 0
```

13. Define a Report: LEVEL BREAKS

Enter 1.

HOW MANY LINES TO SKIP AFTER TOTALS  
(0-9;-1=NEW PAGE)  
CURRENT VALUE:  
NEW VALUE: 1

-- ACCUMULATOR NUMBER: 3. 1 OF 2 THIS BREAK.  
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR. ACCUM)  
CURRENT VALUE:  
NEW VALUE: 8

Enter 8 to indicate that the first part of the Level Break #2 is an accumulator.

Enter 1 to indicate that the information in accumulator #1 is the 1st part of this accumulator.

NUMBER OF HORIZ. ACCUMULATOR TO ACCUMULATE  
CURRENT VALUE:  
NEW VALUE: 1

WHAT LEVEL BREAK TO CLEAR ACCUMULATOR  
CURRENT VALUE:  
NEW VALUE: 2

Enter 2 to indicate that this accumulator ends after the 2nd level (End of File).

Enter 2.

NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT  
CURRENT VALUE:  
NEW VALUE: 2

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 1  
NEW VALUE: 88

Enter 88 as the number of the column where the accumulator is to begin.

13. Define a Report: LEVEL BREAKS

Enter 8 to indicate that the 2nd part of the 2nd level break is an accumulator.

-- ACCUMULATOR NUMBER: 4. 2 OF 2 THIS BREAK.

ACCUM TYPE (1=ALL;2=SEL;3=;LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)  
CURRENT VALUE:  
NEW VALUE: 8

Enter 2 to indicate that the information in accumulator #2 is the 2nd part of this accumulator.

NUMBER OF HORIZ. ACCUMULATOR TO ACCUMULATE  
CURRENT VALUE:  
NEW VALUE: 2

Enter 2 to indicate that this accumulator ends after the 2nd level break (End of File).

WHAT LEVEL BREAK TO CLEAR ACCUMULATOR  
CURRENT VALUE:  
NEW VALUE: 2

Enter 2.

NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT  
CURRENT VALUE:  
NEW VALUE: 2

Enter 106 as the number of the column where the accumulator is to begin.

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 103  
NEW VALUE: 106

13. Define a Report: LEVEL BREAKS

Enter 0 to indicate that Level Break #3 is to occur at the End of the File.

```
-- LEVEL BREAK NUMBER:      3
BREAK ON DATA FILE ITEM NAME/NUMBER
(-1=ALL RECS; 0=END OF FILE)
CURRENT VALUE:              EOF
NEW VALUE:                  0
```

Enter 2 to indicate that Level Break #3 consists of 2 items (totals).

```
HOW MANY TOTALS TO PRINT
CURRENT VALUE:
NEW VALUE:                  2
```

Enter 0 to indicate there are no cross-foot accumulators (this means the total will come from information above rather than across).

```
HOW MANY CROSS-FOOT ACCUMULATORS
CURRENT VALUE:
NEW VALUE:                  0
```

Enter 0.

```
HOW MANY LINES TO SKIP BEFORE TOTALS
(0-9;-1=NEW PAGE)
CURRENT VALUE:
NEW VALUE:                  0
```

Enter 0.

```
HOW MANY LINES TO SKIP AFTER TOTALS
(0-9;-1=NEW PAGE)
CURRENT VALUE:
NEW VALUE:                  0
```

Enter 3 (for LITERAL).

```
-- ACCUMULATOR NUMBER: 5.  1 OF 2 THIS BREAK.
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)
CURRENT VALUE:
NEW VALUE:                  3
```

13. Define a Report: LEVEL BREAKS

Enter 14 slashes (-----).

Enter 92 as the number of the column where the slashes (-----) are to begin.

```
ENTER LITERAL DATA
CURRENT VALUE:
NEW VALUE: -----
(LITERAL LENGTH IS: 14)

WHAT COLUMN TO PRINT ACCUMULATOR
(O=NOT PRINTED)
CURRENT VALUE:      1
NEW VALUE:         92
```

Enter 3 (for LITERAL).

Enter 14 slashes (-----).

```
-- ACCUMULATOR NUMBER: 6.  2 OF 2 THIS BREAK.
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)
CURRENT VALUE:
NEW VALUE:         3

ENTER LITERAL DATA
CURRENT VALUE:
NEW VALUE: -----
LITERAL LENGTH IS: 14
```

Enter 113 as the number of the column where the slashes (-----) are to begin.

```
WHAT COLUMN TO PRINT ACCUMULATOR
(O=NOT PRINTED)
CURRENT VALUE:      107
NEW VALUE:         113
```

13. Define a Report: LEVEL BREAKS

Enter 0 to indicate that Level Break #4 is to occur at the End of File.

```
-- LEVEL BREAK NUMBER:      4
BREAK ON DATA FILE ITEM NAME/NUMBER
(-1=ALL RECS; 0=END OF FILE)
CURRENT VALUE:      EOF
NEW VALUE:          0

HOW MANY TOTALS TO PRINT
CURRENT VALUE:
NEW VALUE:          3
```

Enter 3 to indicate that Level Break #4 consists of 3 items (totals).

```
HOW MANY CROSS-FOOT ACCUMULATORS
CURRENT VALUE:
NEW VALUE:          0

HOW MANY LINES TO SKIP BEFORE TOTALS
(0-9;-1=NEW PAGE)
CURRENT VALUE:
NEW VALUE:          0
```

Enter 0.

```
HOW MANY LINES TO SKIP AFTER TOTALS
(0-9;-1=NEW PAGE)
CURRENT VALUE:
NEW VALUE:          0

-- ACCUMULATOR NUMBER: 7.  1 OF 3 THIS BREAK.
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)
CURRENT VALUE:
NEW VALUE:          3
```

Enter 3 (for LITERAL).

13. Define a Report: LEVEL BREAKS

Enter the words GRAND TOTALS as the first part of the 7th accumulator.

ENTER LITERAL DATA  
CURRENT VALUE:  
NEW VALUE: GRAND TOTALS  
LITERAL LENGTH IS: 12

Enter 75 as the number of the column where the words GRAND TOTAL are to begin.

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 1  
NEW VALUE: 75

Enter 8 to indicate the 2nd input for this accumulator is another accumulator.

-- ACCUMULATOR NUMBER: 8. 2 OF 3 THIS BREAK.  
ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)  
CURRENT VALUE:  
NEW VALUE: 8

Enter 1 to indicate that the Accumulator #1 is to the input.

NUMBER OF HORIZONTAL ACCUMULATOR TO ACCUMULATE  
CURRENT VALUE:  
NEW VALUE: 1

Enter 0 (this accumulator appears at the End of the File).

WHAT LEVEL BREAK TO CLEAR ACCUMULATOR  
(0=NEVER)  
CURRENT VALUE:  
NEW VALUE: 0

Enter 2.

NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT  
CURRENT VALUE:  
NEW VALUE: 2

Enter 88 to begin printing this accumulator in column number 88.

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 88  
NEW VALUE: 88

13. Define a Report: LEVEL BREAKS

Enter 8 (for HOR.ACCUM) to indicate Accumulator #9 consists of an accumulator (and will use the total as input.

Enter 2 to indicate that accumulator #2 is begin calculated.

Hit RETURN to leave set at 0.

Enter 2.

Enter 106 to begin printing the GRAND TOTAL figure in column 106.

The screen displays the request.....

Hit ESCAPE to end this section and return to the Report Definition Menu.

If you made any mistakes, you can hit RETURN and scroll through the requests and re-enter information.

-- ACCUMULATOR NUMBER: 9. 3 OF 3 OF THIS BREAK.

ACCUM TYPE (1=ALL;2=SEL;3=LIT;4=NUM;  
5=INT;6=ALPHA;7=DATE;8=HOR.ACCUM)  
CURRENT VALUE:  
NEW VALUE: 8

NUMBER OF HORIZ. ACCUMULATOR TO ACCUMULATE  
CURRENT VALUE: 0  
NEW VALUE: 2

WHAT LEVEL BREAK TO CLEAR ACCUMULATOR  
CURRENT VALUE: 0  
NEW VALUE:

NUMBER OF DIGITS TO RIGHT OF DECIMAL POINT  
CURRENT VALUE: 2  
NEW VALUE: 2

WHAT COLUMN TO PRINT ACCUMULATOR  
(0=NOT PRINTED)  
CURRENT VALUE: 103  
NEW VALUE: 106

HIT ESCAPE TO EXIT PROGRAM  
OR RETURN TO MAKE MORE CHANGES

## 14. Lookahead Titles

Select #3 DETAIL LINE PRINT ITEMS, HORIZ. ACCUMS, AND HEADINGS from the Define a Report menu.

NOTE that you have already run this function. Now that your file is sorted, you are going to enter a LOOKAHEAD Title. A Lookahead Title is a line of information that describes the data that follows it. The information previously entered is still correct. You need only enter information for part of this function.

When requested for the name of the REPORT and FILE DEFINITION FILE, enter Sample.

The screen displays the request.....

Enter 1.

(The Current Value is displayed as 0 because when you ran this section before you requested 0.)

The screen displays the request.....

Hit RETURN.  
(You still have 1 Detail Line).

```
NUMBER OF LOOKAHEAD ITEM
CURRENT VALUE:  0
NEW VALUE:     1
```

```
NUMBER OF DETAIL LINE PER DATA RECORD
CURRENT VALUE:  1
NEW VALUE:
```

The screen displays the requests.....

Hit RETURN.  
(You still have 8 print elements).

The screen displays the request.....

Hit RETURN.

```
DETAIL LINE NUMBER:  1
NUMBER OF PRINT ELEMENTS FOR THIS DETAIL LINE
CURRENT VALUE:     8
NEW VALUE:
```

```
NUMBER OF LINES TO SKIP BETWEEN
DATA RECORDS (0-9)
CURRENT VALUE:     0
NEW VALUE:
```

14. Define a Report: LOOKAHEAD TITLES

The screen displays the request.....

Hit RETURN.  
(You still have 2 Horizontal Accumulators).

Because you requested 1 LOOKAHEAD Title above,  
the screen displays the request.....

Enter 1.

```
TOTAL NUMBER OF HORIZONTAL ACCUMULATORS
CURRENT VALUE:      2
NEW VALUE:

LEVEL BREAK NUMBER FOR LOOKAHEAD HEADING
CURRENT VALUE:      0
NEW VALUE:          1
```

The screen displays the request.....

Enter 3 (for LITERAL).

The screen displays the request.....

Enter SALES FOR: (include the colon).

```
-- LOOKAHEAD PRINT ELEMENT NUMBER:  1

LOOKAHEAD ITEM TYPE (3=LIT;4=NUM;
5=INT;6=ALPHA;7=DATE)
CURRENT VALUE:      0
NEW VALUE:          3

ENTER LITERAL DATA
CURRENT VALUE:
NEW VALUE:          SALES FOR:
```

The screen displays the request.....

Enter 2.

```
PRINT IN COLUMN NUMBER:
CURRENT VALUE:      1
NEW VALUE:          2
```

14. Define a Report: LOOKAHEAD TITLES

The screen displays the request.....

Hit ESCAPE.

(If you made a mistake you can hit RETURN and scroll through the requests to re-enter information.) This section scrolls through the requests you entered in Chapter 3.

When the screen displays.....

HIT ESCAPE TO EXIT THIS SECTION  
OR RETURN TO MAKE MORE CHANGES

--DETAIL LINE NUMBER: 1  
--PRINT ELEMENT NUMBER: 1

Hit ESCAPE at the request for NEW VALUE.

Hit ESCAPE again at the beginning of the next section (for HORIZONTAL ACCUMULATOR NUMBER: 1.

The Report Definition Menu will return.

Hit ESCAPE again to return to the ANALYST main menu.

## **15. Print a Report**

Select #4 (PRINT A REPORT) from the ANALYST menu.

Ensure that your printer is on and 132 column paper is aligned.

Your Report should appear as shown on the next page.

Sample of Analyst Report -- STAGE II.

STRUCTURED SYSTEMS GROUP, INC.  
Sample of Analyst

PAGE 1  
DATE 07/15/81

NAME	PRODUCT	# SOLD	DATE	UNIT PRICE	% COMM.	TOTAL SALE	TOTAL COMM.
SALES FOR:							
Allen Abrahms	executive desk	2	06/28/81	600.00	6.00	1,200.00	72.00
Allen Abrahms	File Cabinets	8	06/28/81	128.00	6.00	1,024.00	61.44
Allen Abrahms	File Cabinets	2	06/28/81	128.00	6.00	256.00	15.36
Allen Abrahms	30 x 72 walnut desk	5	06/29/81	405.00	6.00	2,025.00	121.50
						-----	-----
						4,505.00	270.30
SALES FOR:							
Brad Brownstone	30 x 72 walnut desk	1	06/26/81	405.00	7.00	405.00	28.35
						-----	-----
						405.00	28.35
SALES FOR:							
Carol Crenshaw	File Cabinets	3	06/27/81	128.00	6.00	384.00	23.04
Carol Crenshaw	Conference Table	3	06/27/81	500.00	6.00	1,500.00	90.00
						-----	-----
						1,884.00	113.04
SALES FOR:							
Debbie Davies	stack chairs	50	06/27/81	35.00	6.00	1,750.00	105.00
Debbie Davies	stack chairs	60	06/28/81	35.00	6.00	2,100.00	126.00
Debbie Davies	30 x 72 walnut desk	6	06/28/81	405.00	6.00	2,430.00	145.80
Debbie Davies	30 x 72 walnut desk	2	06/28/81	405.00	6.00	810.00	48.60
						-----	-----
						7,090.00	425.40
SALES FOR:							
Edward Eckoff	drawer organizer files	18	06/28/81	12.75	7.00	229.50	16.07
Edward Eckoff	File Cabinets	8	06/28/81	128.00	7.00	1,024.00	71.68
						-----	-----
						1,253.50	87.75
						-----	-----
GRAND TOTALS						15,137.50	924.84

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(Figure 15.1: Sample of Analyst Report -- STAGE II.)

## **APPENDIX**

### **16. Additional Features**

You can specify certain items to print on the ANALYST Report. Up to 10 range or match selection conditions may be used with ascending or descending order.

The EXTRACT program can create new files containing specified information from the original file.

ANALYST can print reports on created by other programs. A conversion program enables you to change files to fit the ANALYST format. ANALYST updates the Header Record automatically.

An enquiry program searches your file for records based on RANGE or MATCH.

A parameter file is automatically created by ANALYST. This file can be modified to adapt ANALYST to work with computers with less than 48K of RAM.

See the ANALYST Reference Manual for instructions, examples, and illustrations.

## 17. Summary of Acceptable Responses (INPUT)

### Types of INPUT for ACCUMULATORS

(All Accumulators are totals. H#, etc. means that you enter H and the number of the item or Accumulator. i.e. H6 is Horizontal Accumulator #6).

- H#=HOR: Horizontal Accumulator (Across Column Total).  
Input can be an Item or another Horizontal Accumulator.  
(i.e. The TOTAL COMMISSION rate is determined by the  
COMMISSION RATE Item and the TOTAL SALE Accumulator.)
- S#=SUM: A SUMMARY Accumulator is a report grand total created  
by the EXTRACT program. See the ANALYST Reference  
Manual, Chapter 25.
- B#=BRK: Level Break. Input to an Accumulator can be a Total Line  
Accumulator calculated when a Level Break occurs. This is  
most often used when calculating percents of sub-totals.  
See the ANALYST Reference Manual, Chapters 15 and 20.
- X#=XFT: Cross-Foot Accumulator. These are used for calculating  
totals of Level Breaks. See the ANALYST Reference  
Manual, Chapter 24.
- I#=ITM: Item. This is the most often used input for an Accumulator.  
It specifies the item on which to perform the calculation.
- O=NONE: Enter 0 or hit RETURN.

(Figure 17.1: Types of INPUT for ACCUMULATORS)

### Types of INPUT for ITEMS

ALPHA: ALPHA items may contain numbers, letters, or symbols, except double quotes ("), up to the maximum length defined for the item (indicated by the "<" character).

NUMERIC: NUMERIC items may contain up to the maximum number of digits defined for the item. Commas, letters, and other symbols are not accepted. A leading minus sign is allowed for negative numbers.

INTEGER: INTEGER items accept up to the maximum number of digits defined for the item. Integers are whole numbers, with no decimal digits.

DATE: DATE items accept only valid dates in MM/DD/YY form, where the letters are replaced by numbers (for example, 12/5/81). The form DD/MM/YY may be used if the ANPR1.101 file has been modified (see Chapter 30).

Pressing ESCAPE (followed by RETURN) at any data entry request begins the next record (when in adding mode), or returns the ENTER FUNCTION request (when adding a single record). Entering an up-arrow (^) takes you back to the previous request.

(Figure 17.2: Types of INPUT for ITEMS)

### Types of INPUT for ELEMENTS

ELEMENT TYPE	MEANING
1 ALL	Prints record number relative to all records on the data file
2 SEL	Prints records number relative to all records on the report
3 LIT	Prints a literal value you define
4 NUM	Prints a NUMERIC data item
5 INT	Prints an INTEGER data item
6 ALPHA	Prints an ALPHA data item
7 DATE	Prints a DATE data item
8 ACCUM	Prints a horizontal accumulator on the detail line

(Figure 17.3: Types of INPUT for ELEMENTS)